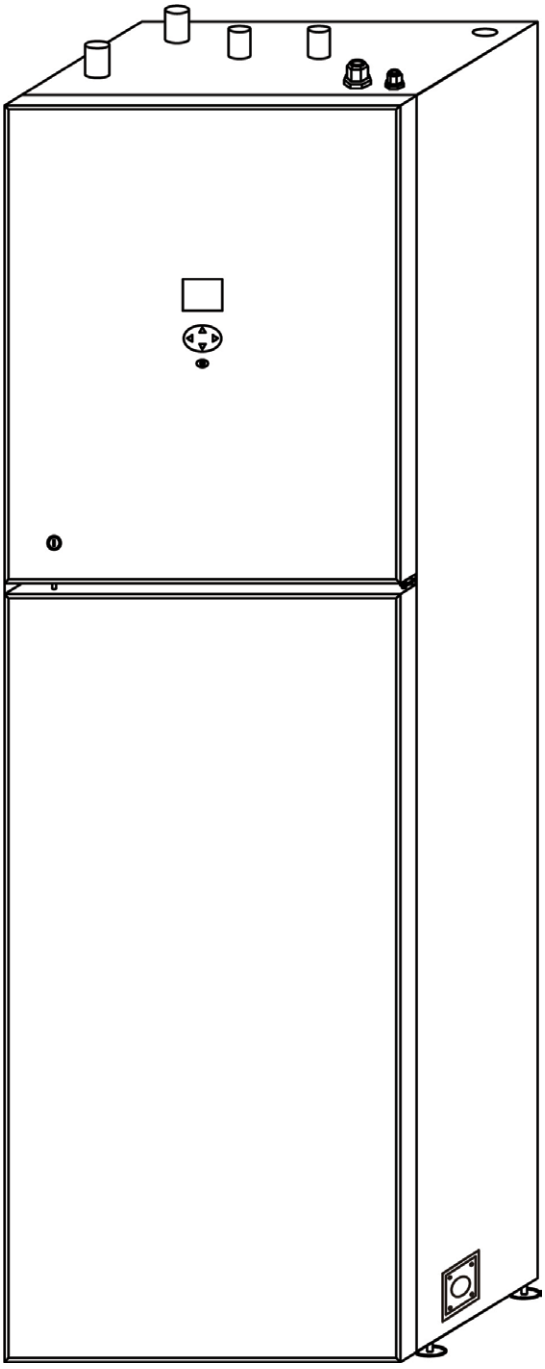
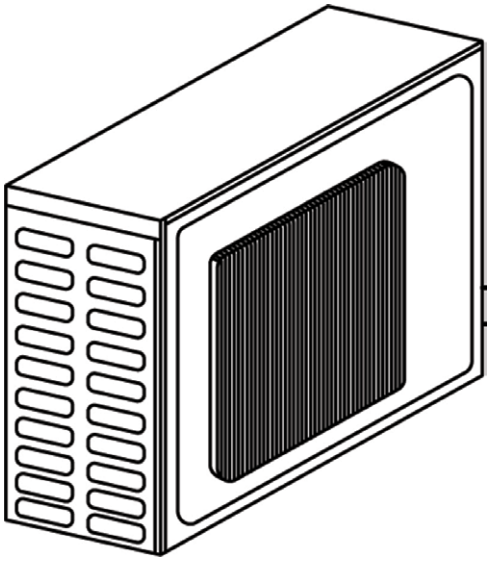
AIR MAGNA 150

Green Energy ANTEK®

INSTALLATION AND MAINTENANCE INSTRUCTIONS





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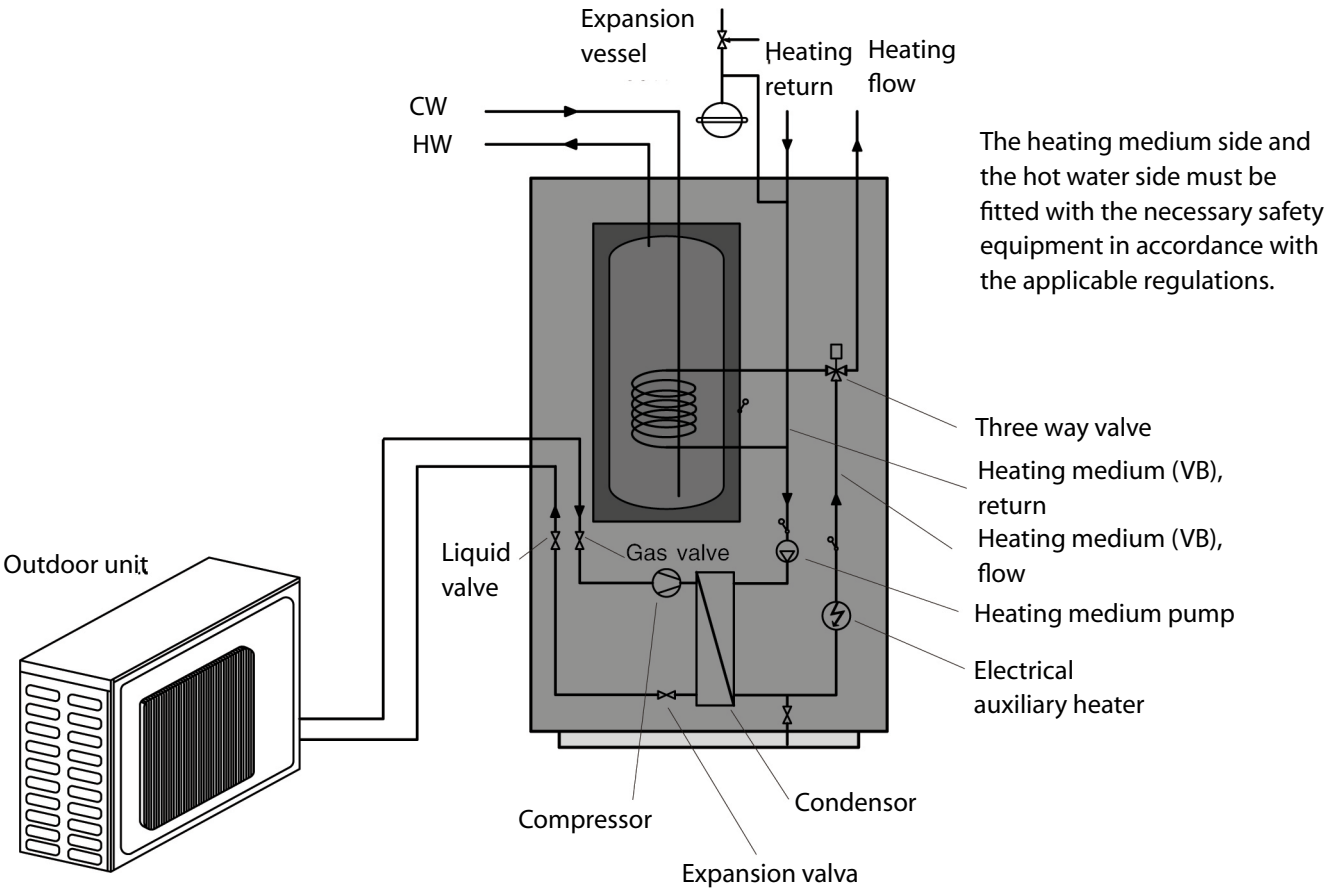
SYSTEM DESCRIPTION

Unit Description

AIR MAGNA 150 consists of a heat pump, water heater, electrical module, circulation pumps and a control system.
AIR MAGNA 150 is connected to the Outdoor Unit and heating medium circuits.
The heat source of the AIR MAGNA 150 is provided from air. The Outdoor Unit of the system is a heat exchanger for collecting the heat of air.

The air emits its heat to the refrigerant in the evaporate of Outdoor Unit. It then vaporises and is compressed in the compressor. The refrigerant, the temperature of which has now been raised, is passed to the condenser where it gives off its energy to the heating medium circuit and, if necessary, to the water heater. After the condenser there is a built-in electrical module which cuts in if there is a high demand.



SYSTEM DESCRIPTION

Unit Description

In order to get the best results from the climate system AIR MAGNA 150 you should re ad through the section For the System manager in these Installation and Maintenance instructions.
AIR MAGNA 150 is a clim ate sys tem for heating houses and apartment buildings as well as industrial properties. Air is used as the heat exchange source.
AIR MAGNA 150 is a complete heating installation for heating and hot water.
It is fitted with new design on the market to be developed specifically for heat pumps. A new evaporator enables a new and improved circulation system for the refrigerant. The heat pump has an integrated 150 or 200 litre water tank and an immersion heater. The Tap Water Stratification system improves the efficiency of heat transfer by keeping the water in distinct thermal layers in the water tank.
The unit is fitted with a regulating computer , which is controlled over a graphic display unit.
Heat is distributed throughout the house over a hydronic heating system referred to as low temperature system with a maximal water temperature to radiators (supply line temperature) of 65°C. Most of the heating demand is taken care of by the heat pump (compressor unit), the auxiliary heater being started only when demands exceed available heat pump capacity.

AIR MAGNA 150 consists of five main components:

a. Heat Pump Unit
Rotory or Scroll-compressor
Stainless steel heat exchangers
Circulation pumps for brine system (brine) and heating systems
Valves and safety equipment for refrigerant system, complete with necessary electric components

b. Water Heater
150 or 200 litre
Lined with copper sheet against corrosion or made of stainless steel
Maintenance free as no anode is used

c. Reversing Valve
Opening or closing the connection to water heater according to operating mode: heating or warm water production

d. Auxiliary Heater
3/6/9 kW electric heating element
Three-step capacity control
Fitted on supply line
Delivers back-up heat in case of great heat demand that exceeds heat pump capacity
Starts automatically, provided operating mode "AUTO" has been selected

e. Regulating Equipment
The regulating system controls heat pump components (compressor, circulation pumps, auxiliary heater and reversing valve). Based on data received from sensors, it starts or stops heat pump operation and determines whether heating or warm water shall be produced. The system consists of:
Control computer with graphic display unit
Temperature sensors (outside air, room, supply line, return line system)

SYSTEM DESCRIPTION

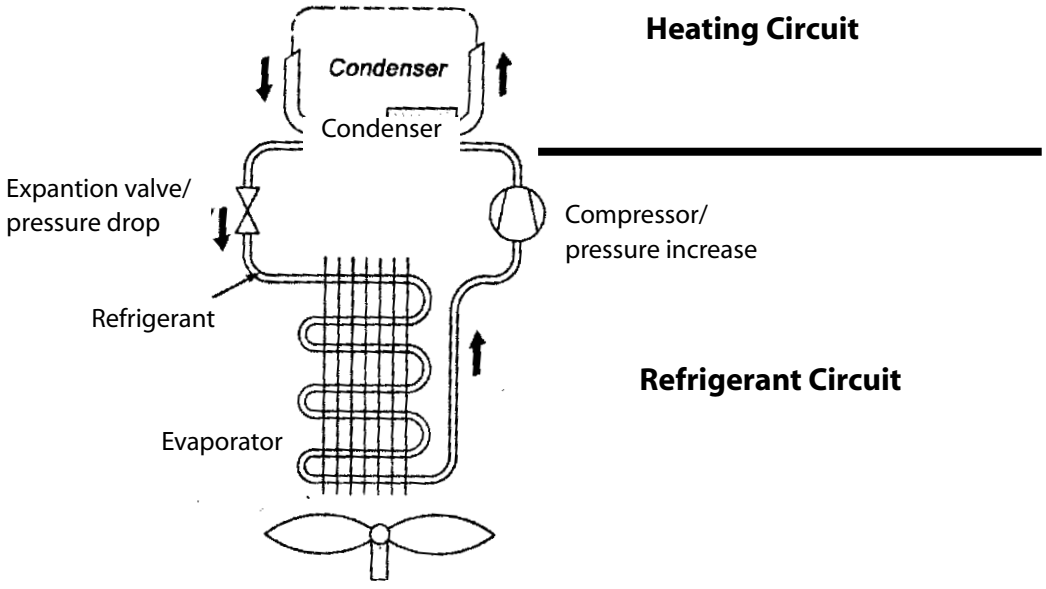
Principle of heat pump

A heat pump can exploit the energy contained in natural heat sources. Or, to put it differently, the heat pump "collects" heat energy from the heat source. This makes the heat pump a very environmentally friendly and economically sound alternative for space heating.

a) The Outdoor Unit is used as the heat pump's evaporator. Here the heat energy of the Outdo or Unit causes the refrigerant, circulating through the evaporator, to boil and turn into a gas – it evaporates.
b) The refrigerant, having absorbed heat energy, is circulated to the compressor where pressure and temperature are raised.
c) The refrigerant continues to the condenser. When condensing, it releases heat energy to the heat carrier, circulating through the condenser. The temperature of the refrigerant sinks, and it returns to its liquid state.
d) The heat energy released is carried by the heating circuit to water h eater and radiator or floor heating systems.
e) At last the refrigerant is led through the expansion valve, where its pressure is reduced, and then continues to the evaporator. The process is restarted.

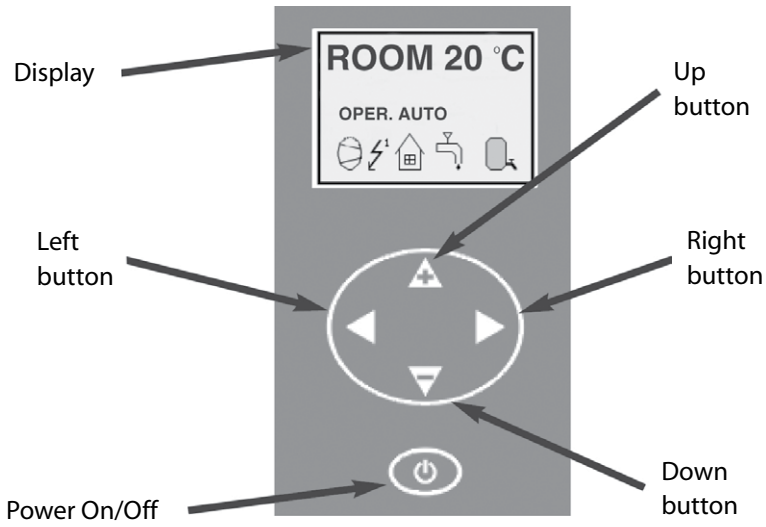
The heat pump has two separate liquid circuits
Refrigerant circuit – circulating inside the heat pump. Through evaporation, compression and condensation it absorbs energy from the outdo or unit and releases it to the heat carrier. The refrigerant is chlorine-free.

Heating circuit – water transporting heat energy to the heating system (radiators/floor coils) and the water heater.



CONTROL PANEL

Layout



EXPLANATION

Control Panel
The control panel of AIR MAGNA 150 features a graphic display control buttons .
Beside the control panel you will find the User's Manual, a short description of how to increase and reduce room temperature, and a label with name and phone number of dealer.

CONTROL PANEL

Functions

The control computer is operated with the help of a user friendly menu system that is displayed on the control panel. There is a main menu and four sub-menus accessible from the main menu. The menus are described in detail further down.
To be able to select the desired menu and increase or reduce preset values, you will use the five buttons.

- One button pointing upwards marked with a plus
- One button pointing downwards marked with a minus
- One button pointing to the right
- One button pointing to the left
- One button pointing to the Power ON/OFF

Symbols

For you to know at a glance the actual operating mode of the heat pump,one of the following symbols will be shown in the lower part of the display depending on which part of the unit is working:

The heat pump is running.

The auxiliary heater is activated. The figure next to the symbol indicates capacity step.

There is a heating demand.

Warm water is being produced.

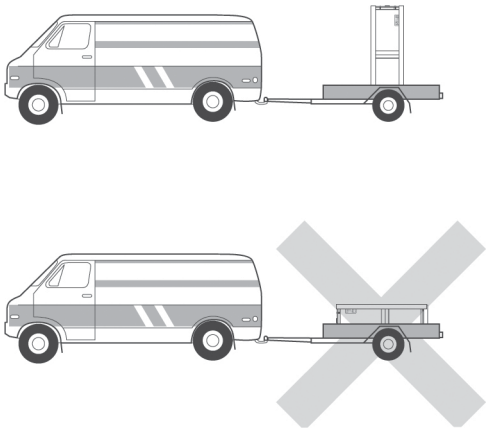
Indicates the status of warm water production. If the symbol is empty, warm water temperature is44°C.

If the symbol is full, warm water temperature is the start temp. +4°C.

GENERAL INFORMATION FOR THE INSTALLER

Transport and Storage

The AIR MAGNA 150 must be transported and stored upright and dry. The AIR MAGNA 150 may however be carefully laid on its back when being moved into a building.



Installation

AIR MAGNA 150 is placed on a firm base, preferably a concrete floor or foundation. Install AIR MAGNA 150 with its back to an outside wall, ideally in a room where noise does not matter. If this is not possible, avoid placing it against a wall behind a bedroom or other room where noise may be a problem. Any wall that backs on to a bedroom should be fitted with sound insulation. Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.

Copper pipe connecting

1) The maximun length of the connecting copper pipe between the mainframe and outdoor unit is 15 meters.
2) There is no need to charge extra refrigerant into the copper pipe while its length is less than 5 meters.
3) While the copper length is more than 5 meters, copper pipe while its length is less than 5 meters every extra 10g refrigerant must be charged for per increased 1 meter length.

Inspection of the installation

Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person and should be documented. The above applies to closed heating systems. If the heat pump is replaced, the installation must be inspected again.

PIPE CONNECTIONS

General

Pipe installation must be carried out in accordance with current norms and directives. The heat pump can operate up to a return temperature of about 58°C and an outgoing temperature of about 70°C from the heat pump. The compressor produces up to 65°C, the rest is obtained using additional heating.
The other heat pumps has a max return temperature of approximately 50 °C and an outgoing max temperature from the heat pump of approximately 60 °C.
Since the AIR MAGNA 150 is not fitted with shut-off valves, these must be fitted outside of the heat pump to make future servicing easier.

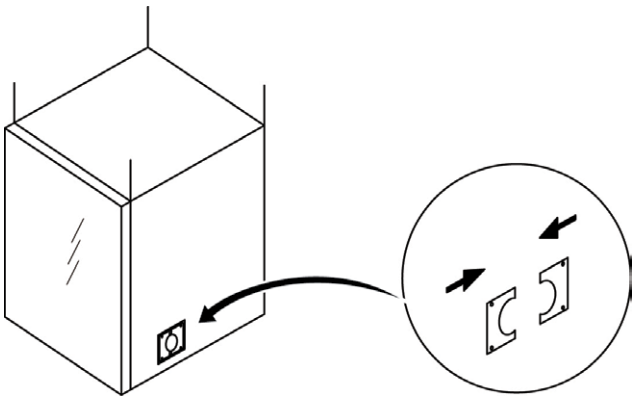
During assembly the pipes for the heat medium and water heater and possibly hot water circulation are routed backwards. The distance between AIR MAGNA 150 and the wall ought to be 50 mm.

Copper pipe connections

According to their practical situation, users can choose the place on mainframe (left or right) for the out of connecting copper pipe.
The size of the outlet for connecting copper pipe can be adjusted by the fixing board.

Copper tuble size

Modell/Size	6	8	10	12	16
Gastube	1/2“	5/8“	5/8“	3/4“	3/4“
Liquidtube	1/4“	3/8“	3/8“	1/2“	1/2“



NOTE! Defrosting temperature sensor and outside temperature sensor should be connected to outdoor unit through the connecting outlet of mainframe and outdoor unit.

NOTE! The pipe system needs to be flushed out before the heat pump is connected so that debris cannot damage component parts.

PIPE CONNECTIONS

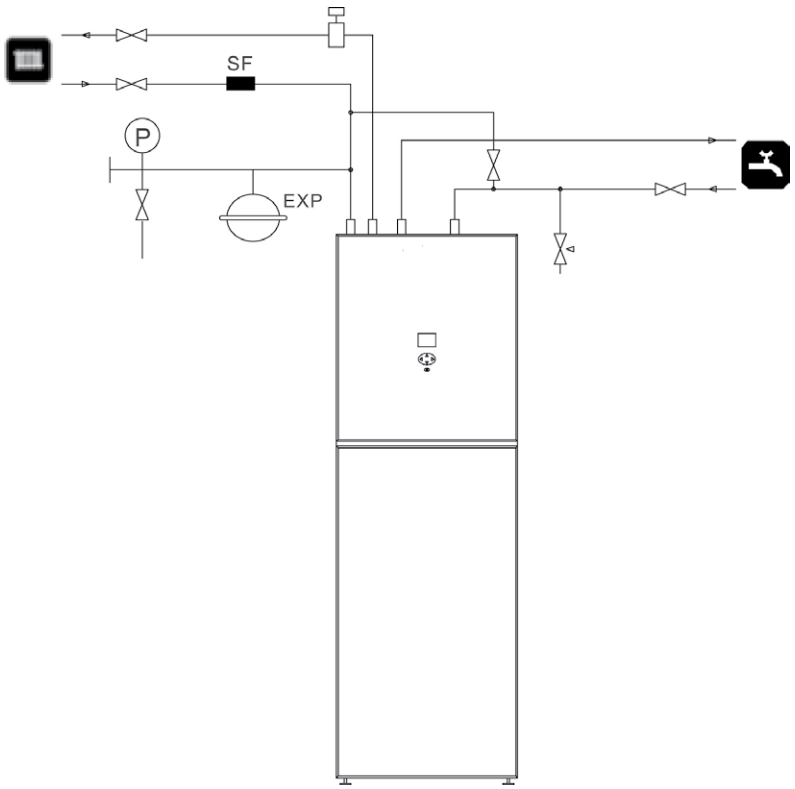
Pipe connections (heating medium)

Pipe connections for the heat medium side are made at the top. All required safety devices, shut-off valves (as close to the heat pump as possible), and particle filter (supplied) are fitted.
When connecting to a system with thermostats on all radiators, a relief valve must be fitted, or some of the thermostats must be removed to ensure sufficient flow.

Pipe connections (water heater)

The heat pump´s water heater must be fitted with the necessary valve equipment.
The heat pump should be supplemented with an electric water heater if a bubble pool or other significant consumer of hot water is installed. The valve coupling in COMPACT (electrical water heater) can be divided. The mixing valve stays in COMPACT and the remaining valve coupling can be used for incoming cold water in AIR MAGNA 150.

VENTING VALVE



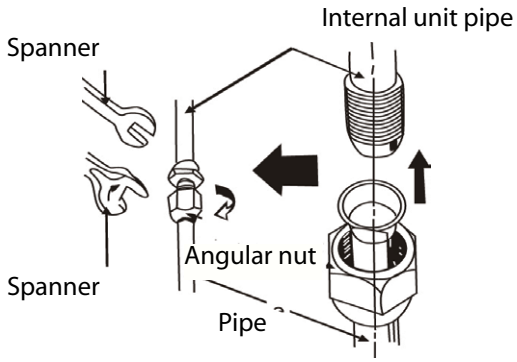
NOTE! The venting valve should be set on the top of the heating medium system.

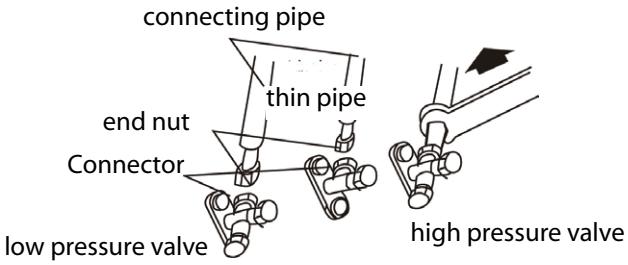
PIPE CONNECTIONS

How to connect the copper pipes

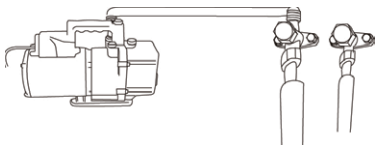
Piping Connection

1. Open the cover of the Outdoor unit.
2. Connect the pipe to the indoor unit and Outdoor unit.
   · Wipe the quick connectors with clean cloth to prohibit dust and impurity entering the pipes.
   · Align the centre of the pipe and fully screw in the angular nuts with Finger.

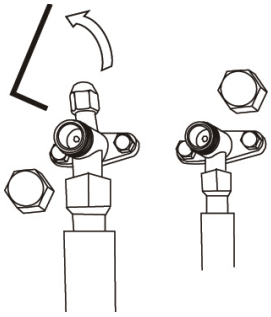




3. Use Vacuum pump to remove the air from indoor unit and connection pipe.



4. Connect the electric cable as per circuit diagram, and bundle it with the connecting pipe.
5. Take off the nuts in the mouths of high valve and low valve, turn the valves core anticlockwise with hexagon panner till the valves are opened completely. Recover and tighten the nuts.
6. Check leakage: check if there is leakage at each connection of the pipes or nuts. If yes, remedial neasure must be taken, leakage is not permitted in any case.



Attention :

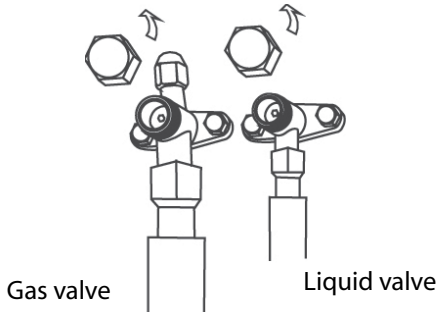
- When connection the pipe, a suitable pitching spanner must be used. If other spanner is used, it may damage the joint due to inappropriate force.
- On connecting the pipe, one should ensure that the insulating material of the pipe be closely fitted to the nuts at the joint.
- On connecting to the external unit, the pipe should be wrapped with sponge padding to prevent rain water from flowing in.
- When bending the pipe, the radius cannot be too small and be about 150~160 mm.

PIPE CONNECTIONS

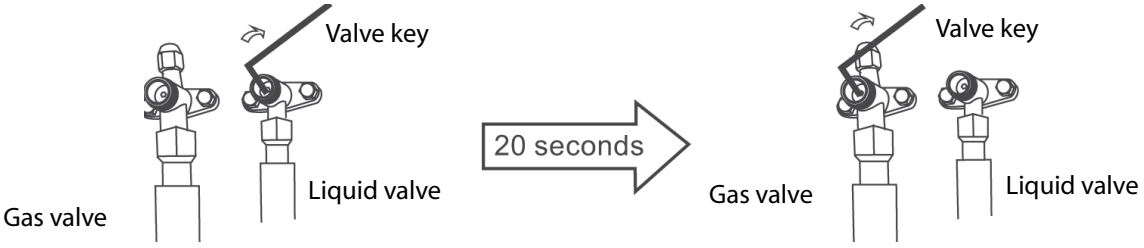
The step and diagram of collect refrigerant

· If the Outdoor Unit needs to be disconnected and moved to another place, please recycle the gas back into the compressor according to the following steps before doing the disconnecting:

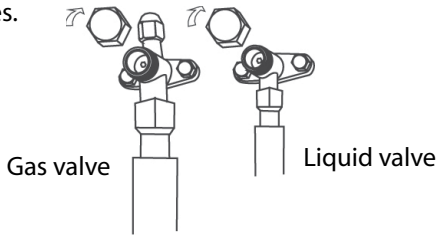
1. Start the machine, operate heat pump on state.
2. Remove the cap of two valves with the spanner.



3. Tighten the core of the liquid valve (the smaller one) with valve key at first . After about 20 seconds, tighten the core of the gas (the bigger one) with valve key. Turn off the machine at once and cut off the power supply.



4. Tighten the cap of two valves.

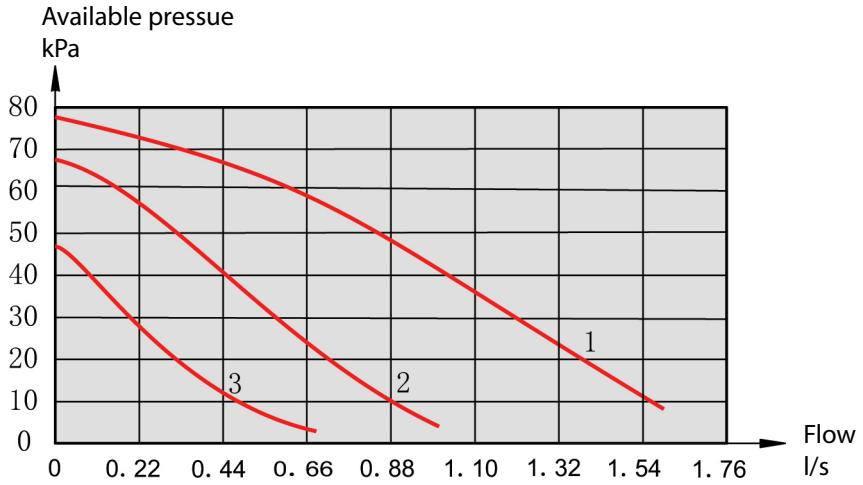


5. Disconnect the power cable from outdoor unit.
6. Loose the nut of the connect pipe to the outdoor unit valve with 2 spanner, disconnect the connect pipe and the two valves.

PIPE CONNECTIONS

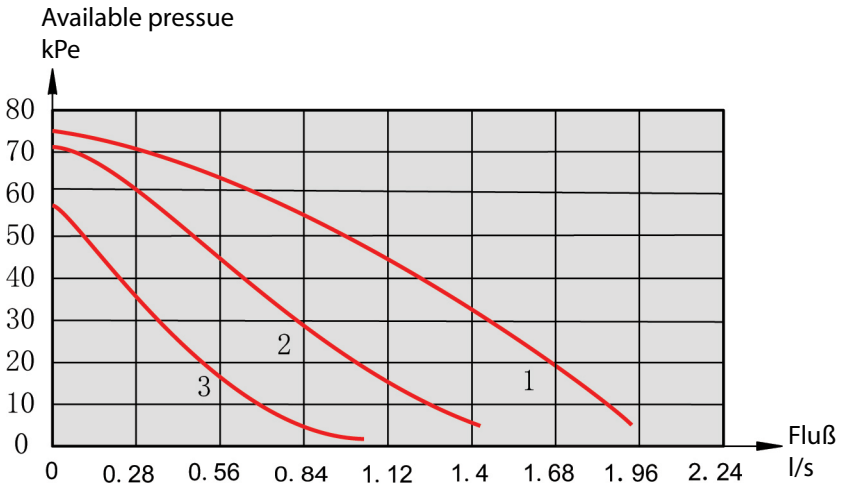
Pump capacity diagrams, heating medium side

AIR MAGNA 150 -6, 8, 10, 12



WILO RS-25/8

AIR MAGNA 150 -16



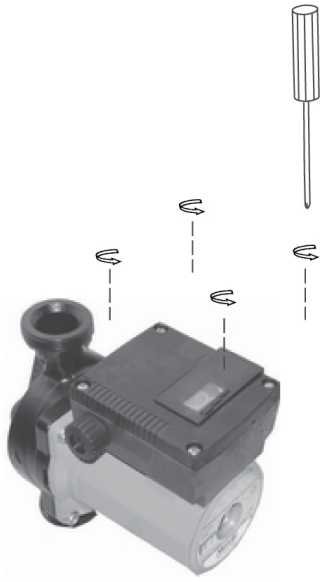
WILO RL-25/7.5

PIPE CONNCETIONS

How to adjust the rate of flow

WILO RS-25/8

The pump is adjustable to adjust the flow: 1, 2, or 3.

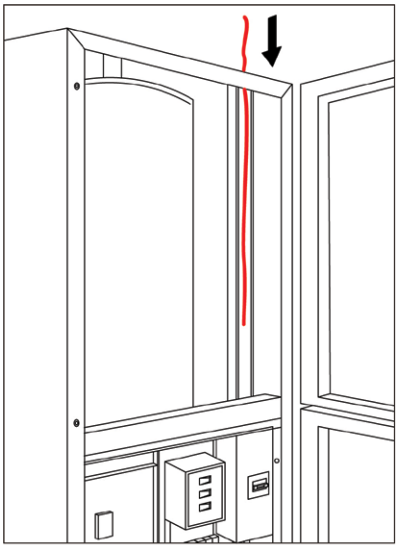


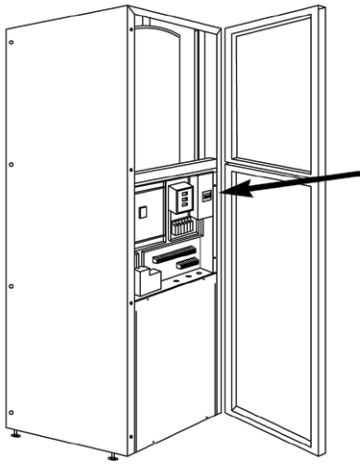
WILO RI-25/7,5

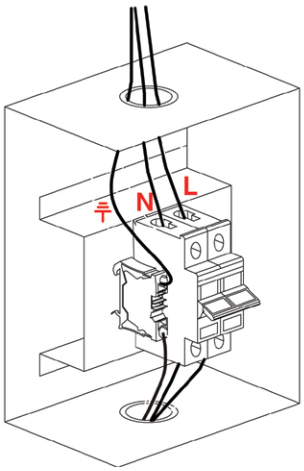
The pump is adjustable to adjust the flow: 1, 2, or 3.

ELECTRICAL CONNECTION

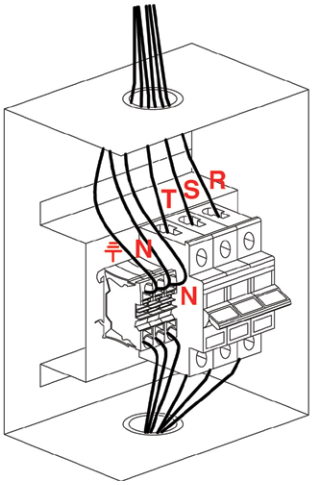
Connect the power cord







(230V/ 50Hz)

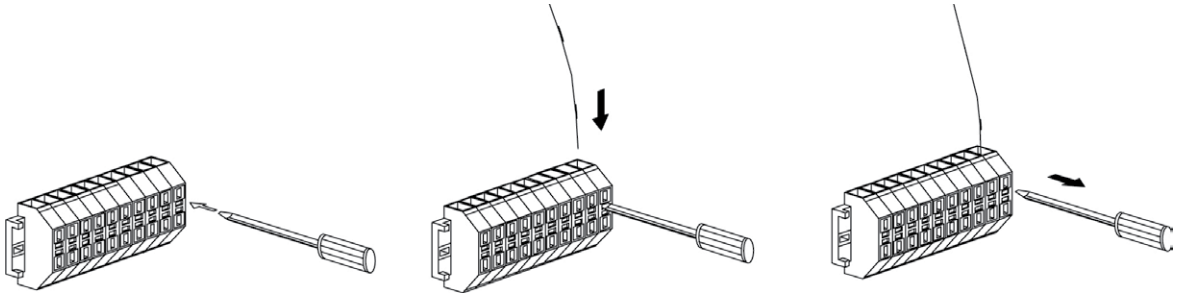


(3x400V/ 350 Hz)

NOTE! Electrical installation and service must be carried out under the supervision of a qualified electrician in accordance with the stipulations in force.

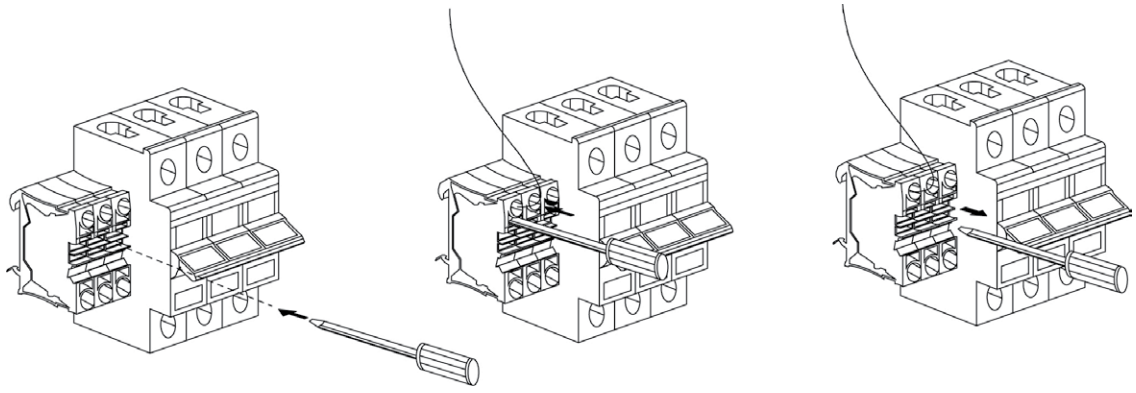
ELECTRICAL CONNECTION

Wirning of the terminal (mode one)



Step1 Step2 Step3

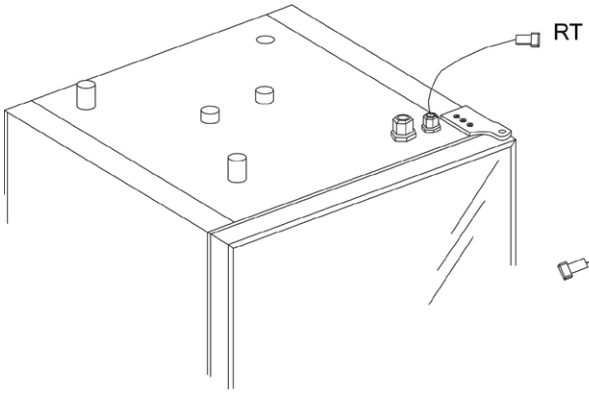
Wirning of the terminal (mode two)



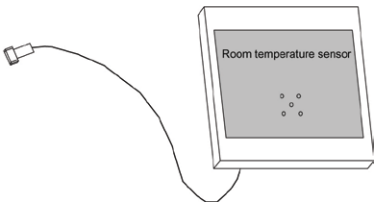
Step1 Step2 Step3

ELECTRICAL CONNECTION

Connecting The Room Temperature Sensor

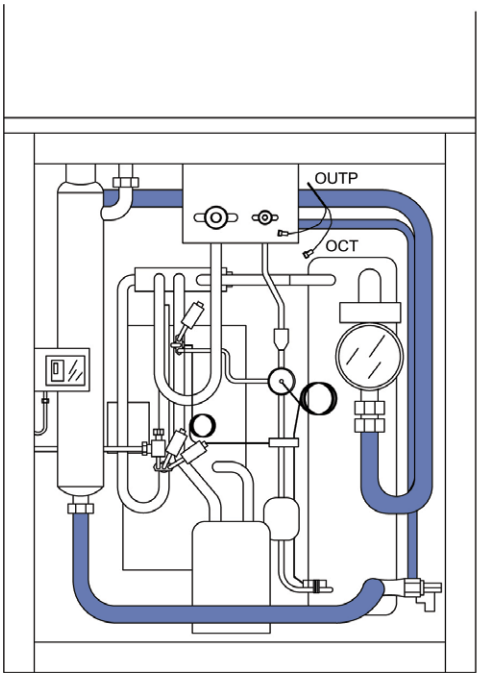


Room temperature sensor



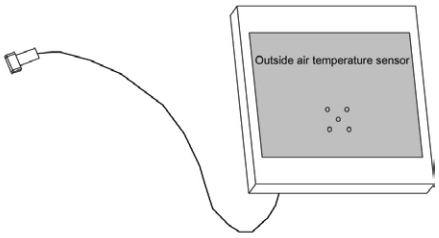
RT = Room temperature sensor

Connecting The Outside Temperature Sensor



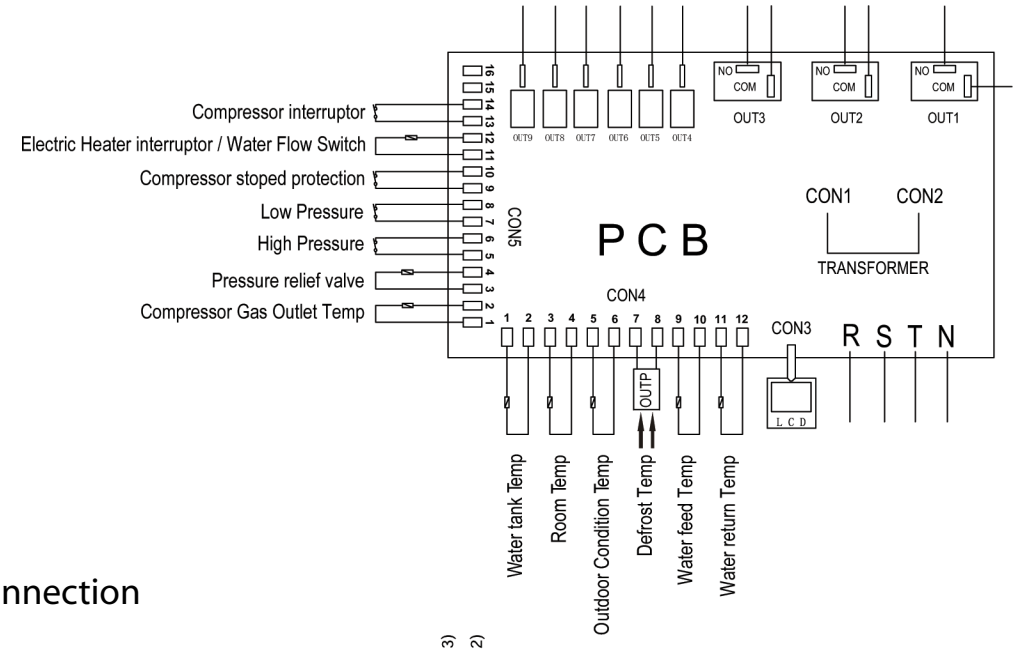
OCT = Outside air temperature sensor
OUTP = Defrost temperature sensor

Outside air temperature sensor

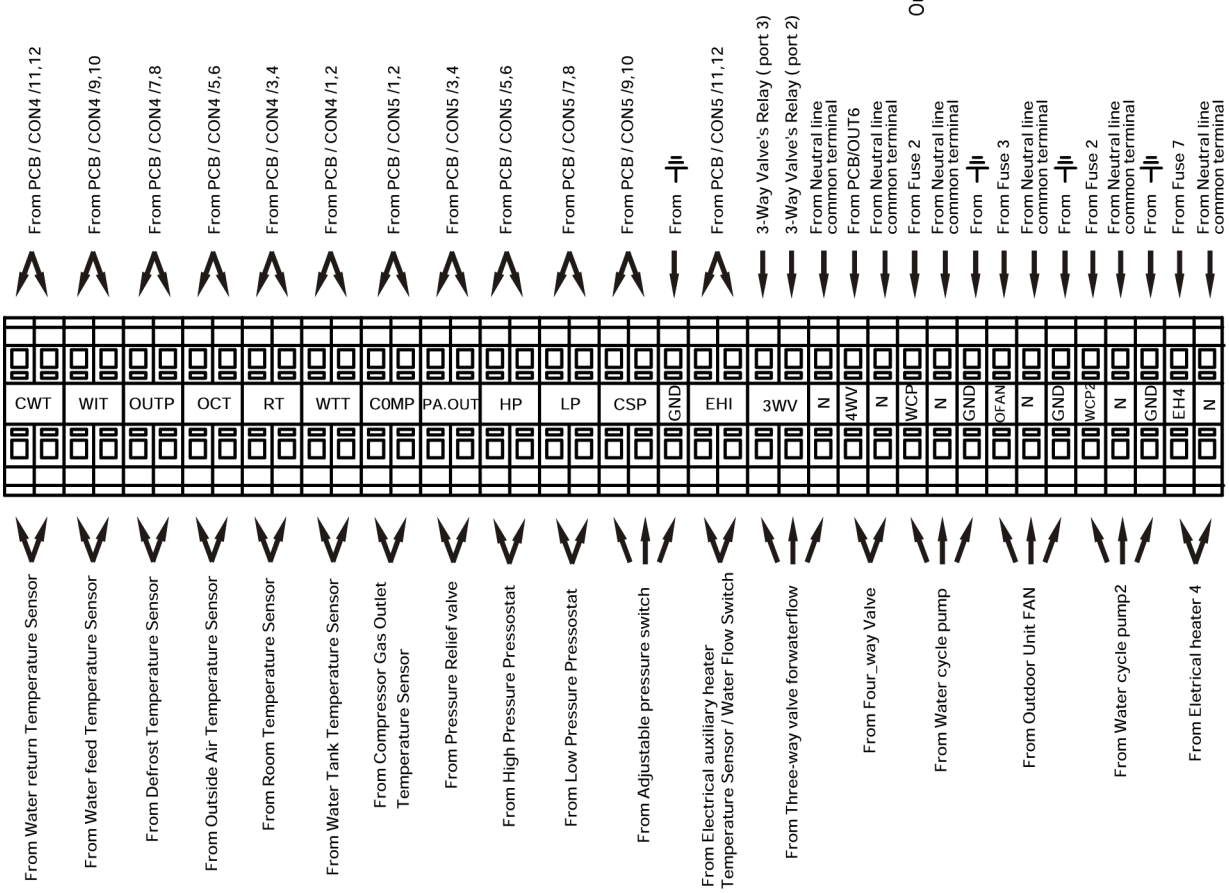


ELECTRICAL CONNECTION

Layout of the PCB



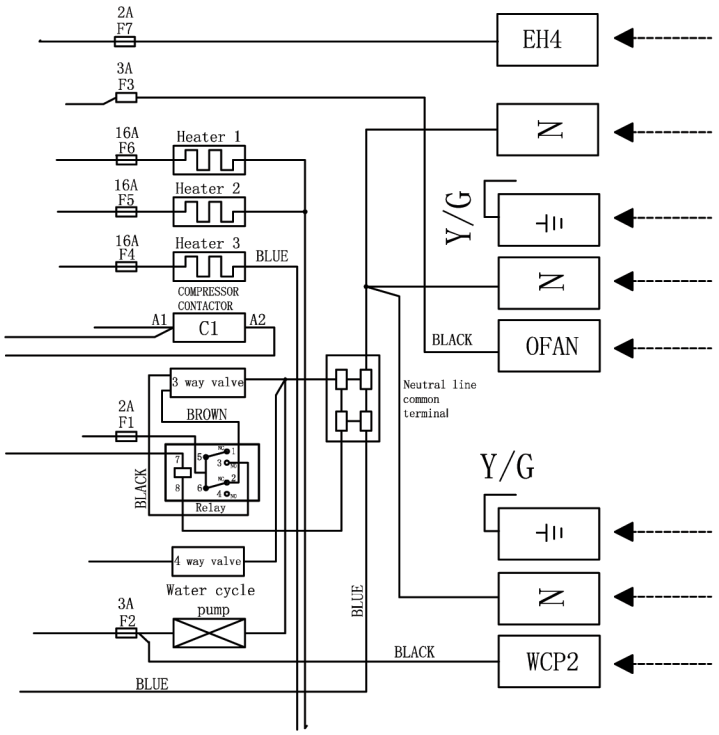
1,5 mm² terminal connection

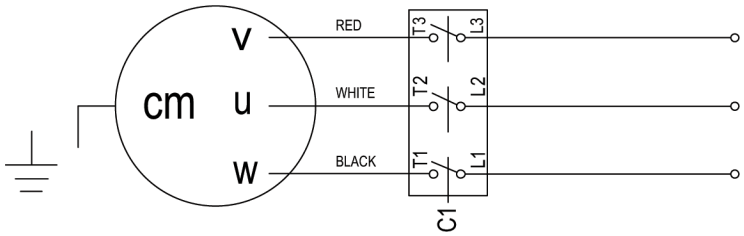


NOTE! The connecting wire of outdoor unit fan, water cycle pump two and electrical heater four should be connected to the 1.5mm² terminal through the hole on the sound insulation board, and connect to outside with the copper pipes.

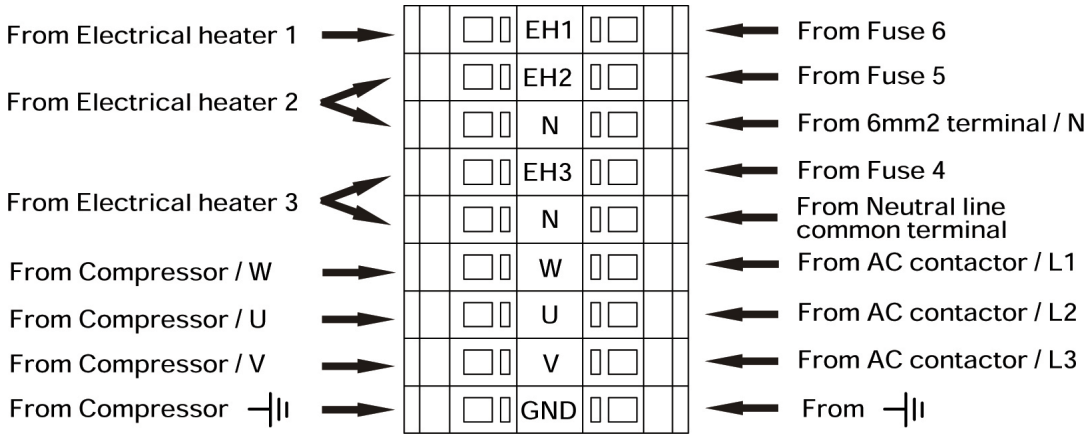
ELECTRICAL CONNECTION

Part of wiring diagramm

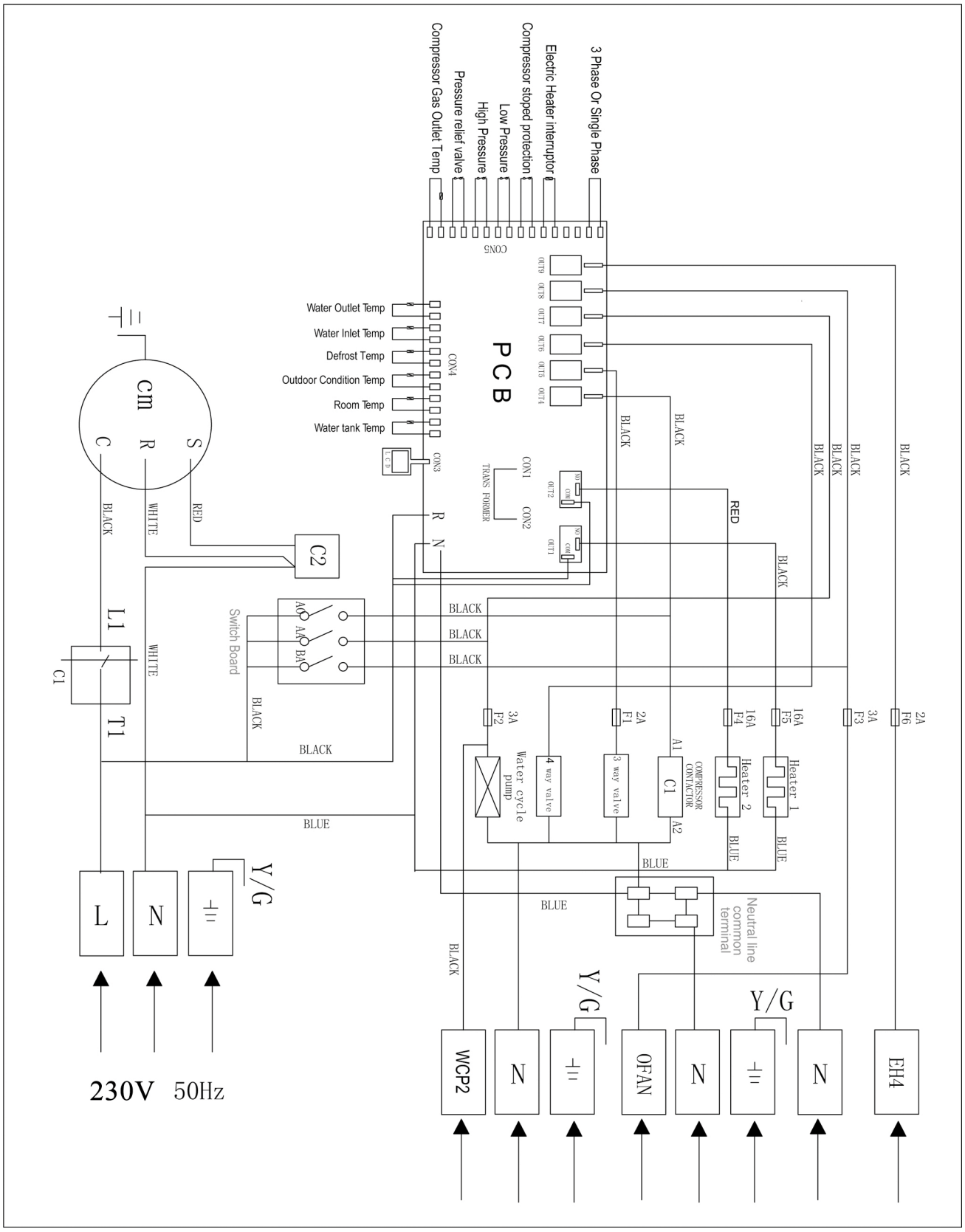




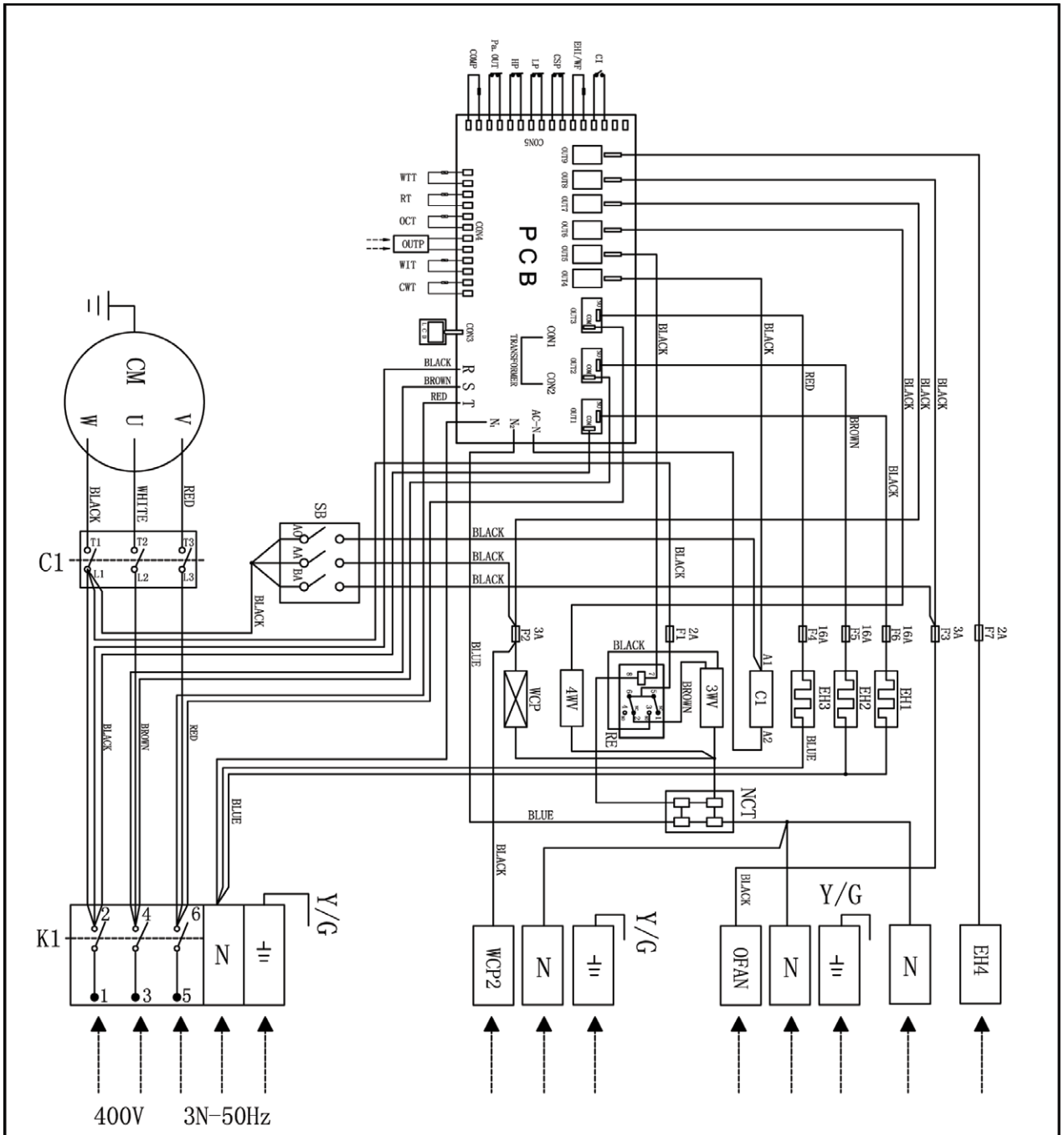
2,5 mm² terminal connection



Wiring Diagramm (230V / 50Hz)



Wiring Diagramm (400V/3/50Hz)



K1	Air Break Switch
C1	Compressor Contactor
SB	Switch Board
CM	Compressor
PCB	Circuit Board
3WV	3 Way Valve
4WV	4 Way Valve
WCP	Water Circulating Pump
WCP2	Water Circulating Pump 2
OFAN	Outdoor Unit Fan Motor
NCT	Neutral Line Common Terminal
RE	Relay for 3 Way Valve
EH1	Electrical Heater 1
EH2	Electrical Heater 2
EH3	Electrical Heater 3
EH4	Electrical Heater 4
CI	Compressor Interruptor
EHI/WF	Electric Heater Interruptor Or Water Flow Switch
CSP	Compressor stoped protection
LP	Low Pressure Switch
HP	High Pressure Switch
Pa. out	Pressure Relief Valve
COMP	Compressor Gas Outlet Temperature sensor
WTT	Water Tank Temperature Sensor
RT	Room Temperature Sensor
OCT	Outside Air Condition Temperature Sensor
OUTP	Defrost Temperature Sensor
WIT	Water Feed Temperature Sensor
CWT	Water Retur Temperature Sensor

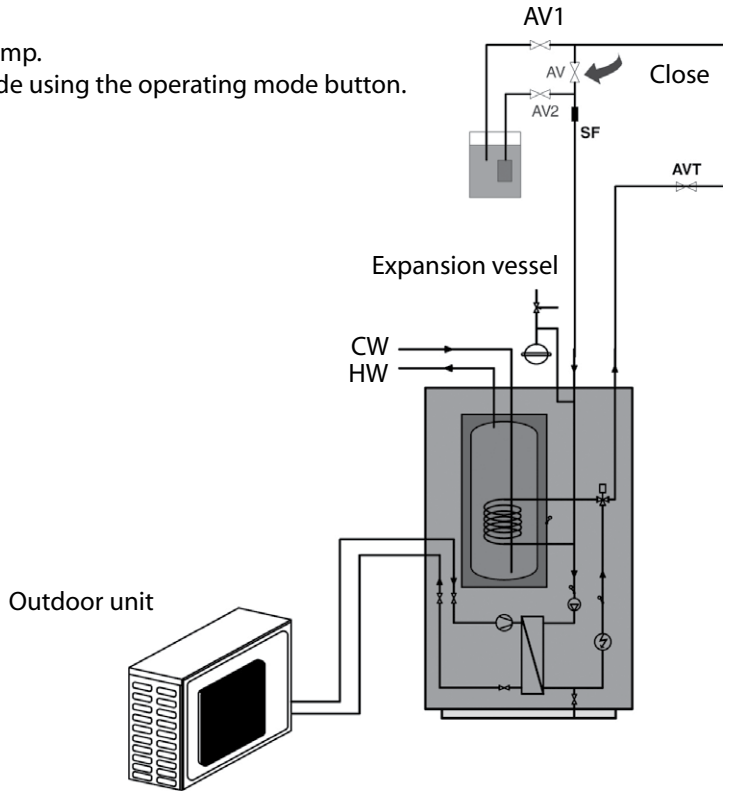
COMMISSIONING AND ADJUSTING

Preperation

Before starting up the system, check that the heating, hot water circuits are full and thoroughly vented.
Check the pipe system for leakage.

Filling and venting the heating medium system

1. Check the heating medium system for leakage.
2. Connect the filling pump and return line on the heating system's service connections as shown in figure.
3. Close the valve between the service connections.
4. Open the valves on the service connections(AV1,AV2).
5. Close the valve of the water tank and heating medium.
6. Start the filling pump, and fill until there is fluid in the return pipe.
7. Maintains the travelling schedule pole of the three way valve for waterflow at the middle position.
8. Press the power ON botton on the control panel. and start the heating medium pump.
9. The filling pump and the heating medium pump are now operational. The fluid should circulate via the container with tap water until it emerges from the return hose without being mixed with air.
10. Stop the filling pump and clean the particle filter.
11. Start the filling pump, open the valve between the service connections.
12. Close the valve on the service connection's return line. Now pressurise the system (to max 3 bar) with the filling pump.
13. Close the valve (AV2) on the service connection.
14. Stop the filling pump.
15. Close the heating medium pump.
16. Select the auto operating mode using the operating mode button.



AVT Draining
SÄV Safety value
CW Cold water
SF Particle filter
HW Hot water

COMMISSIONING AND ADJUSTING

Inspection

Adjust heat medium pump

Check the flow temperature and the return temperature on the control panel. The difference between these two temperatures, with floating condensing, should be 5 - 10 °C when the house is being heated without additional heat. Adjust the flow with the knob on the heating medium pump (16). A high difference could depend on a low heat medium flow. A low difference indicates a high heat medium flow.
The pump is adjustable to adjust heat medium flow.

NOTE! The compressor must not be forced to start with periods shorter that 1 start per 15 minutes.

Readjusting, heat medium side

Air is initially released from the hot water and venting may be necessary. If bubbling sounds can be heard from the heat pump, the entire system requires further venting. When the system has stabilised (correct pressure and all the air removed) the heating controls can be set at the required values.

Emptying the water heater

The siphon principle is used to empty the water heater. This can be done either via the drain valve on the incoming cold water pipe or by inserting a hose into the cold water connection.

The pump is adjustable to adjust heat medium flow

Note! The compressor must not be forced to start with periods shorter than 1 start per 15 minutes.

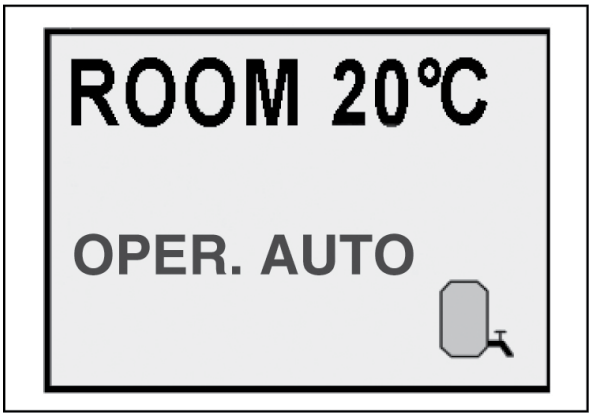
CONTROLE

General Information

Menu Navigation
The right-hand button on the control panel is used to open the desired menu. The left-hand button is used to return to the previous menu . The up and down buttons are used to navigate between the parameters of a menu. A cursor (arrow) on the left-hand side of the display indicates which menu can be opened .
The up and down buttons are also used if you wish to increase or reduce a preset value.

Display of current operating mode
During normal operation, the following in formation will be displayed:

- Desired (preset) room temperature
- Whether there is a heating demand or not. If there is, there will also be symbols telling which heat source is working– heat pump or auxiliary heater or both (see "Symbols" on page 6).

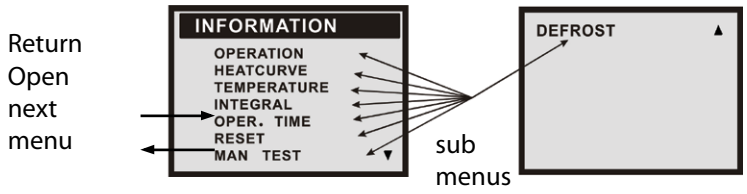


- Which operating mode has been selected In addition to this, the following messages may be displayed:
- PHASE SEQUENCE :
  The compressor in the heat pump is running in the wrong direction, which means that heat is produced by the auxiliary heater only (see "Alarm" on page 36).
- HIGH RETURN :
  The temperature of the water returning from the radiators is too high so the heat pump will not be allowed to produce heat. (see "Alarm" on p. 36).
- START:
  The heat pump is in the process of starting. There is a 30 second delay between start of brine system pump and compressor.
- START_MIN :
  The heat pump will start in the number of minutes indicated in the display.

CONTROL

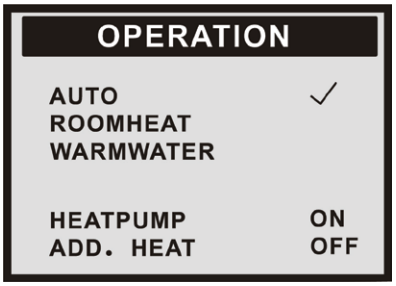
Main Menu Information

To open the main menu INFORMATION, press the right- or left-hand button once.



To select the desired sub-menu use the up or down button. Open the menu by pressing the right-hand button once.
To return to the main menu, press the left-hand button once

Sub-Menu OPERATION



This menu is used for the selection of operating mode. The control system allows for five different operating modes:

- OPERATION HEAT PUMP ON :
  Heat pump (compressor) operation is allowed by the control system.
- OPERATION HEAT PUMP OFF:
  Heat pump (compressor) operation is not allowed by the control system.
- OPERATION ADD. HEAT ON/OFF:
  The auxiliary heater will/will not be allow ed to operate. This operating mode is normally used when a new installation is being put into service, before the brine system is ready for use.
- OPERATION AUTO :
  Heat pump and auxiliary heater are regulated automatically by the control system. The text "OPERATION AUTO" will be displayed on the control panel.
- OPERATION ROOMHEAT :
  The heat pump will be distributed to the heating system only; The heat pump will not produce warm water. The text "OPERATION WARMWATER" will be displayed on the control panel.
- OPERATION WARMWATER :
  The heat pump will only produce warm water; no heat will be istributed to the heating system. The text "OPERATION WARMWATER "will be displayed on the control panel.

CONTROL

Menus

· OPERATION OFF :
Heat pump is turned off. The following text is displayed on the control panel:
"OPERATION OFF " If the heat pump will be put in OPERATION OFF mode during winter, please remember to let out all the water the heating system to avoid any damage caused by freezing.

If you wish to change operating mode:

a. Open the main menu INFORMATION by pressing the right- hand button once. You will find the sub-menu named OPERATION.
b. Open the OPERATION menu by pressing the right-hand button once.
c. Select the desired mode by pressing either the "up" or "down" button.
d. Return to the main menu by pressing the "up" button until to the top, and press left-hand button twice.

Sub-Men HEAT CURVE

This menu is used for making adjustments that affect the room temperature. For more information, please refer to "Adjustments to be made regularly" on page 26.

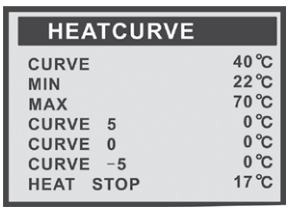


Table 1: Menu– HEAT CURVE

Menu Text	**Description**	**Adjustable by:**
CURVE:	The value entered shows the temperature of the water to be distributed to the radiators(supply line temperature) when the outside air temperature is 0°C.	User (see "Adjustment of CURVE value" on p. 27)
MIN:	Adjustment of value for lowest supply line temperature allowed.	User (see "Adjustment of MIN and MAX values" on p. 30)
MAX:	Adjustment of value for highest supply line temperature allowed.	User (see "Adjustment of MIN and MAX values" on p. 30)
CURVE 5:	Adjustment of room temperature when the outside air temperature is +5°C.	User (see "Adjustment of CURVE value" on p. 27)
CURVE 0:	Adjustment of room temperature when the outside air temperature is 0°C.	User (see "Adjustment of CURVE value" on p. 27)
CURVE – 5:	Adjustment of room temperature when the outside air temperature is -5°C.	User (see "Adjustment of CURVE value" on p. 27)
HEAT STOP:	Production of radiator heat is stopped when outside air temperature is equal to or higher than the value for heat stop entered.	User, if require

CONTROL

Sub-Menu TEMPERATURE

This menu shows the different temperatures of the heating system. All temperature changes registered over the last 60 minutes are stored in the control system and can be viewed in the shape of graphs.

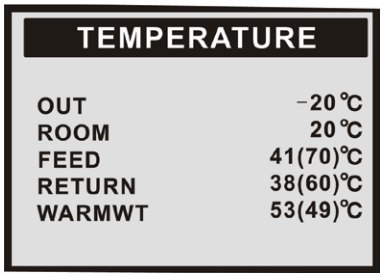
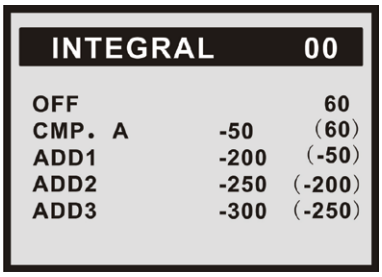


Table 2: Menu TEMPERATURE

Menu Text	**Description**	**Adjustable by:**
OUT:	Outside air temperature	-------
ROOM:	Desired (setpoint) room temperature	User (see "Adjustment of ROOM value" on page 28).
FEED:	Actual (measured) supply line temperature of heating system; in brackets the set point (desired) value.	Not adjustable. (The temperature necessary to keep the desired room temperature is determined by the control system).
RETURN:	Measured return line temperature of heating system; in brackets the maximum return temperature allowed.	Installation contractor. To be a dapted to each individual unit
WARMWT:	Measured warm water temperature; in brackets the starting temperature for warm water production.	Not adjustable.

Sub-Menu INTEGRAL



CONTROL

Menus

Menu Text	Description	Adjustable by
OFF:	When the value (testing) reaches the value setting by user, the system will be closed.	USER
CMP.A:	A When the value (testing) reaches the value setting by user, the compressor will be start-up. And the value(testing) under the value(setting),the compressor will be closed.	USER
ADD1:	When the value (testing) reaches the value setting by user, the ADD1 will be start-up. And the value(testing) under the value(setting), the ADD1 will be closed.	USER
ADD 2:	When the value (testing) reaches the value setting by user , the ADD2 will be start-up. And the value(testing) under the value(setting), the ADD2 will be closed.	USER
ADD 3:	When the value (testing) reaches the value setting by user , the ADD3 will be start-up. And the value(testing) under the value(setting), the ADD3 will be closed.	USER

Sub-Menu OPERATING TIME

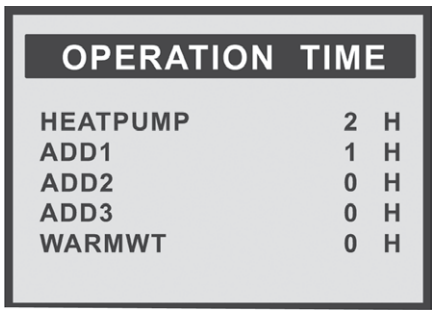


Table 3: Menu OPERATING TIME

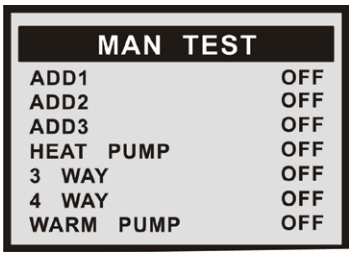
Menu Text	Description	Adjustable by:
HEATPUMP:	Total operating hours of heat pump since installation. Operating time will not be reset to zero.	USER
ADD 1:	Total operating hours of auxiliary heater (3kW) since installation. Operating time will not be reset to zero.	USER
ADD 2:	Total operating hours of auxiliary heater (6kW) since installation. Operating time will not be reset to zero.	USER
ADD 3:	Total operating hours of auxiliary heater (9kW) since installation. Operating time will not be reset to zero.	USER
WARMWT:	Total operating hours of water heater since installation. Operating time will not be reset to zero.	USER

CONTROL

Sub-Menu RESET

Reset to factory setting value.

Sub-Menu MAN TEST



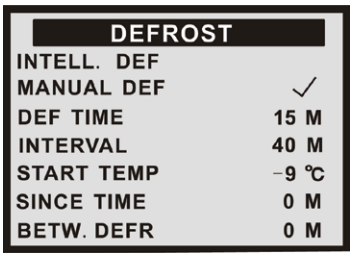
How to enter the Sub-Menu MAN TEST:

You need to choose the„MAN TEST“ on the main menu (INFORMATION) And press the right button for 3 second .

The Sub-Menu MAN TEST contains ADD1 / ADD2 / ADD3 / HEAT PUMP / 3 WAY 4 WAY / WARM PUMP ;

You can choose ON / OFF to control the each part for testing.

Sub-Menu DEFROST



How to enter the Sub-Menu MAN TEST:
Press the right button. Then„ DEFROST“ menu can be seen.
You can choose„ Intell Defrost“ or„ Manual Defrost“

INTELL.DEF:	Auto defrost mode; defrost time and defrost interval interval will be set by system automatically.
MANUAL DEF:	Manual defrost mode; defrost time and defrost can be set by yourself.
DEF TIME:	The range of the setting defrost time: (2 ~ 20 min). Default value: 15 min.
INTERVAL:	The range of the setting defrost interval: (25 ~ 70 min). Default value: 40 min.
START TEMP:	The range of the start temperature of defrost: (-8 ~ -15°C). Default value: -9°C .
SINCE TIME:	Show the last value of the defrost time. Not adjustable.
BETW.DEFR:	Show the last value of the defrost interval. Not adjustable.

Adjustments to be made regularly

Most settings will be made by the installation contractor in connection with installation. Adjustments to be made regularly by the user are the following:

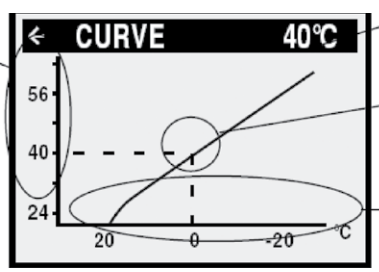
- Selection of operating mode
- Adjustment of desired room temperature by changing the ROOM value.
- Adjustment of heat curve
- Adjustment of maximum and minimum values for supply line temperature

Adjustment of the value for HEAT STOP is possible. (Please refer to "Adjustment of HEAT STOP value" on p. 31).

CONTROL

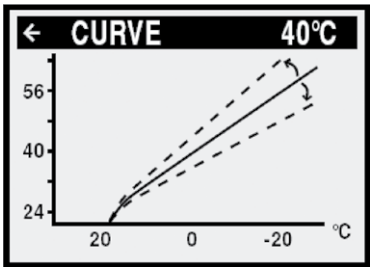
Adjustments to be made regularly

The indoor temperature should be adjusted by changing the heat curve of the installation. The control computer determines the correct temperature of the water to be distributed to the heating system based on the heat curve. The heat curve will be adjusted in connection with installation. It must be adapted later on, however, to obtain a pleasant indoor temperature under any weather condition. A correct heat curve reduces maintenance and saves energy.
The heat curve determines the supply line temperature depending on the outside air temperature. The lower the outside air temperature, the higher the supply line temperature. In other words, the temperature of the water fed to t he radiators will increase exponentially as the outside air temperature falls.
If you select CURVE in the sub-menu named HEAT CURVE, a diagram will be displayed. It represents the relation of outside air temperature to supply line temperature. This relation is referred to as heat curve.



Adjustment of the CURVE value

The heat curve will be adjusted by the CURVE value.
This value indicates the supply line temperature to the radiators at 0°C outside temperature. At outside air temperatures lower than 0°C, the water sent to the radiators will be warmer than 40°C.
At outside temperatures higher than 0°C, the water will be colder than 40°C. When you increase the CURVE value, the heat curve will become steeper and when you reduce it, it will become flatter.
This is the most energy and cost efficient way to set the indoor temperature and should therefore be used for long term temperature settings. If you wish to make a temporary change of temperature, you can simply change the ROOM value (see "Adjustment of the ROOM value" on page 28) .
Factory setting of CURVE value is 40°C, at an outside air temperature of 0°C. The value is adjustable between 22°C and 56°C



CONTROL

Adjustments to be made regularly

If you wish to change the CURVE value:

1 Open the main menu INFORMATION by pressing the right- or the left-hand button once. You will find the cursor at the sub-menu named OPERATION

2 Press the "down" button to move the cursor to the sub-menu called HEAT CURVE.

3 Press the right-hand button once to open the menu. You will find the cursor at the parameter CURVE

4 Open the selected parameter by pressing the right-hand button once.

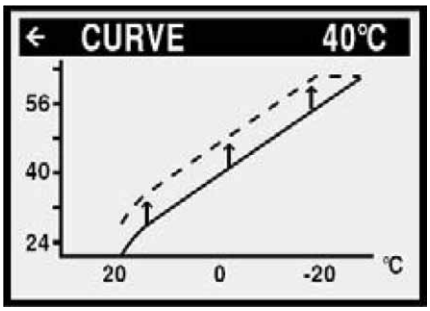
5 Increase or reduce the preset value using the "up" or "down" button. You will see from the diagram how the gradient of CURVE changes.

Press the left-hand button three times to return to the main menu.

Adjustment of ROOM value

As mentioned above, you can also adjust heat curve and indoor temperature by changing the ROOM value. If you use ROOM value to adjust the heat curve, the gradient does not change, i.e. it doesn't become steeper or flatter. Instead, the whole curve is moved by 3°C for every degree by which the ROOM value is changed.
The relation supply line temperature to outside air temperature will not be affected. The supply line temperature will be increased or reduced by the same number of degrees all along the heat curve. See the following diagram.
Adjustment of the ROOM value should only be used for temporary changes of the indoor temperature. For long term settings, the CURVE value should be adjusted as this is the most energy and cost efficient way to set the indoor temperature.
For adjusting the heat curve, please refer to the chapter "Adjustment of the CURVE value" on page 27.

Factory setting of ROOM value is 20°C.



Changing the ROOM value

If you wish to change the ROOM value:

1 Press the "up" or "down" button once to open the ROOM value for adjustment.

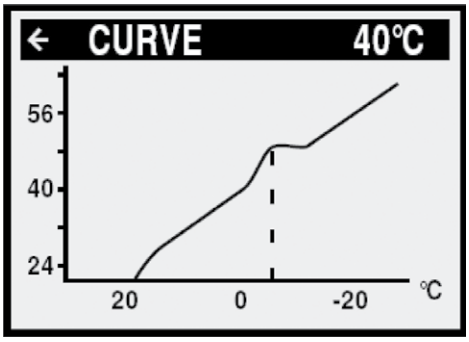
2 Increase or reduce the preset value using the "up" or "down" button so that the desired room temperature is reached. Wait for 10 seconds or press the left-hand button once to return to the main menu.

CONTROL

Adjustment of part of the Heat Curve

At outdoor temperatures between -5°C and +5°C part of the heat curve may need adjusting if the indoor temperature does not stay at the preset ROOM value. For this reason, the control system includes a function adjusting the curve at three outside temperatures: -5°C, 0°C, +5°C. This function will allow you to increase or reduce th e supply line temperature, without affecting the heat curve, at three specific outdoor temperatures. If, for example, the outside temperature is -5°C, the supply line temperature will change gradually in the outdoor temperature range of 0°C to -10°C, maximum adjustment being reached at -5°C. The diagram below shows an adjusted CURVE -5. The point of maximum adjustment is clearly visible.

As we have seen, you can choose to adjust the heat curve at three specified out- side air temperatures: -5°C, 0°C and +5°C. The supply line temperature can be changed by plus/minus 5 degrees.



If you wish to change a specific part of the heat curve:

1 Open the main menu INFORMATION by pressing the right- or left-hand button once. You will find the cursor at the sub-menu OPERATION.

2 Press the ”down” button to move the cursor to the sub-menu HEAT CURVE.

3 Open the selected menu by pressing the right-hand button once. You will find the cursor at the parameter CURVE.

4 Using the ”up” or ”down” button, select either CURVE 5, CURVE 0 or CURVE -5.

5 Open the selected curve by pressing the right-hand button once.

6 Raise or lower the value, using respectively the ”up” or ”down” button. To return to the main menu, press the lefthand button three times.

CONTROL

Adjustment of the MIN and MAX value

The MIN and MAX value is the lowest respectively highest value that is allowed for the supply line temperature. Adjusting the minimum and maximum supply line temperature is particularly important if your home has floor heating. If your house has floor heating and parquet floor, the supply line temperature should not be higher than 45°C.
Else the floor might get damaged. If you have floor coils and stone tiles, the MIN value should be 22-25°C in summer when no heating is required – to obtain a comfortable floor temperature.

If there is a basement to your house, the MIN value should be adjusted to a suitable temperature in summer too, to avoid a humid and chilly basement. In such cases, the value for HEAT STOP needs being adjusted upwards.

If you wish to change the MIN or MAX value:

1 Open the main menu INFORMATION by pressing the right- or left-hand button once.
You will find the cursor at the sub-menu OPERATION

2 Press the "down" button to move the cursor to the sub-menu HEAT CURVE

3 Open the selected menu by pressing the right-hand button once. You will find the cursor at the parameter CURVE.

4 Press the "down" button to move the cursor to MIN.

5 Open the selected parameter by pressing the right-hand button once. The cursor is at MIN

6 Raise or lower the value, using the "up" and "down" button respectively.

7 Press the left-hand button three times to return to the main menu.
Repeat the procedure to change the MAX value, replacing MIN by MAX at step 4.

CONTROL

Adjuatmanet of the HEAT STOP value

The HEAT STOP function stops all production av radiator heat when the outside air temperature is equal to or higher than the value entered for heat stop. When the heat stop function is activated, the circulation pump will be turned off except when warm water is being produced. Even if shut off, the pump will be "exercised" during 1 minute a day. Factory setting for heat stop is 17°C.

If you wish to change the HEAT STOP value:

1 Open the main menu INFORMATION by pressing the right- or left-hand button once.
You will find the cursor at the sub-menu OPERATION

2 Press the "down" button to move the cursor to the sub-menu HEAT CURVE

3 Open the selected menu by pressing the right-hand button once.

4 You will find the cursor at the parameter CURVE.

5 Press the "down" button to move the cursor to HEAT STOP

6 Open the selected parameter by pressing the right-hand button once. The cursor moves to HEAT STOP

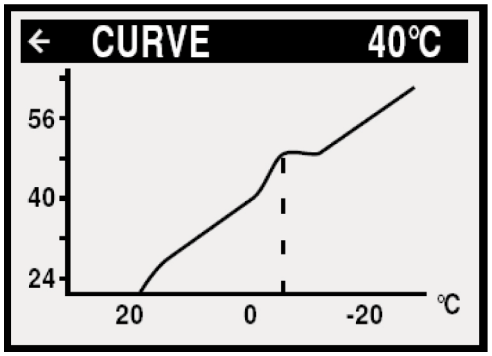
7 Raise or lower the value, using respectively the "up" or "down" button.

8 Press the left-hand button three times to return to the main menu.

CONTROL

Graph of recent changes in TEMPERATURE

All temperatures registered during the last hour can be viewed in the sub-menu TEMPERATURE in the shape of a graph. This will enable you to monitor changes in the different system temperatures.



There is a graph available for all temperatures, except for the ROOM temperature, where you can only view the setpoint value. The integral value that is displayed represents the heating system's energy balance.

If you wish to check the TEMPERATURE graphs:

1 Open the main menu INFORMATION by pressing the right- or left-hand button once.
You will find the cursor at the sub-menu OPERATION.

2 Press the "down" button to move the cursor to the sub-menu TEMPERATURE

3 Open the menu by pressing the right-hand button once.

4 You will find the cursor at the parameter OUT.

5 Press the "down" or "up" button to move the cursor to the desired temperature.

6 Open the selected value by pressing the right-hand button once. A graph will be shown in the display.

7 Move the cursor along the time axis using the "up" (plus) or the "down" (minus) button.
The exact temperature at the selected point of time appears at the top of the display.

8 Press the left-hand button three times to return to the main menu.

CONTROL

Maximum Return Line Temperature

The maximum return line temperature, i.e. temperature of the water returning from the heating system, should be adapted to each individual installation. The correct temperature value for your system will be entered by your installation contractor in connection with installation and can be adjusted later.

Warm Water Production

The temperature of the water distributed to the water heater is controlled by the regulating pressure switch and cannot be adjusted.
Reading of warm water temperature.

To check the actual warm water temperature on the display:

1 Open the main menu INFORMATION by pressing the right- or left-hand button once. You will find the cursor at the sub-menu OPERATION.

2 Press the "down" button to move the cursor to the sub-menu called TEMPERATURE.

3 Open the menu by pressing the right-hand button once.

4 Press the "down" button to move the cursor to the parameter WARMWATER.

5 Open the selected parameter by pressing the right-hand button once.
Agraph will be shown of last hour's warm water temperatures.

6 Press the left-hand button three times to return to the main menu.

The value displayed next to the parameter WARMWA TER is the actual hot water temperature. The value in brackets is the temperature at which warm water production will start. When the actual temperature falls below that value, warm water production starts. The starting value is not adjustable.

CONTROL

Regular Checks

Check of Operating Mode
In the event of an alarm, The background light of LCD will flash and an alarm message will be displayed.

Check the alarm indicator regularly to make sure that the heat pump works properly. You would not always notice if there is something wrong, as the auxiliary heater would start automatically (provided, of course, operating mode AUTO was selected). For more information, please refer to the chapter ALARM MESSAGES on p. 36.

Checking the Water Level of the Heating System
The pressure of the heating system should be checked once monthly. The pressure, shown on the external pressure gauge, should be 1-1,5 bar. If the value is below 0.8 bar with cold water in the heating system, more water must be added (applies to a closed expansion vessel). To find out where the pressure gauge is located.

You can use ordinary tap water for filling the heating system. In some rare cases the water quality would be unsuitable for this purpose (corrosive or calcareous water). In case of doubt, we would recommend that you call your installation contractor.

Don't use any water treatment additives for the heating system!

CONTROL

Regular Checks

Checking the Safety Valves
Both safety valves of the heating system should be checked at least four times a year to prevent lime deposits to clog the mechanism. To find out where the safety valves are located.

The safety valve of the water heater protects the closed heater against positive pressure. It is fitted on the cold water inlet line, its outlet opening facing down- wards. If the safety valve is not checked regularly, the water heater might be damaged. It is quite normal that the safety valve lets out small amounts of water when the water heater is being charged, especially if a lot of warm water was used previously.

To check the safety valves, give the cap a quarter of a turn clockwise until the valve lets out some water through the overflow pipe.

If a safety valve does not work properly, it must be replaced. Check with your installation contractor.
The opening pressure of the safety valve is not adjustable.

In the Event of Leakage

In the event of leakage in the warm water lines between unit and water taps, the shut-off valve on the cold water inlet line should be closed immediately.

Call your installation contractor . In the event of leakage in the system circuit, turn off the heat pump and call your installation contractor immediately.

CONTROL

Alarm Messages

In the event of an alarm message, try to re-start the unit with the safety switch.
If this does not work, try to solve the problem with the help of the table below.
Call your installation contractor if you need help.

Table: Alarm Messages

Message	Signification	Cause	Action
LOW PRESS ERROR:	Low pressure switch cut out. Compressor is stopped. No warm water is produced.	Not enough liquid in system. Air in system. Clogged strainer in system.	Call your installation contractor.
HIGH PRESS ERROR:	Low pressure switch cut out. Compressor is stopped. No warm water is produced. the installation contractor.	Not correctly opened radiator/ floor coil thermostats. Air in heating system. Clogged strainer in heating system	Open radiator or floor coil thermostats. Fill and bleed the heating system or call the installation contractor.
MOTOR P ERROR:	Motor protection cut out. Compressor is stopped. No warm water is produced.	Power failure caused by fuse or safety switch	Open radiator or floor coil thermostats. Fill and bleed the heating system or call the installation contractor.
ADD ERROR:	Overheat protection cut-out.	Electrical fault. The safety switch has cut out.	Check fuses and reset safety switch if cut out.
OUT SENSOR:	Error outside air sensor. The value 0°C will be used for calculation of supply line setpoint value.	Electrical fault	Call your installation contractor
FEEDLINE SENSOR:	Error supply line sensor. All operation stopped, except circulation pump of heating system.	Electrical fault	Call your installation contractor.
RETURN SENSOR:	Error return line sensor	Electrical fault	Call your installation contractor.
WARM WATER:	Error warm water sensor. No warm water production.	Electrical fault.	Call your installation contractor.
ROOM SENSOR:	Actual (measured) room temperature is not displayed. The value 20°C will be used for calculation of supply line setpoint temperature.	Electrical fault.	Call your installation contractor.
ERR PHASE SEQ:	Heat compressor rotates in the wrong direction. Heat is produced by auxiliary heater only.	Phase order reversed when changes were made to electric installation.	Call your installation contractor.
HIGH RETURN:	Temperature of water returned from radiators too high.	Not correctly opened radiator/ floor coil thermostats. Heat pump operation is not allowed.	Make sure that all all thermostats are completely open.

CONTROL

Terminology and Abbreviations

Evaporate:
In the evaporator, energy from the heat source is absorbed by the refrigerant passing through the evaporator. The refrigerant turns into gas. (See "Heat Pump Principle" on p. 4).

INTEGRAL:
INTEGRAL is the heat balance of the heating system. Production of heat is regulated acc. to a calculated heat demand value . This value is determined by comparing the actual supply line temperature with its calculated (setpoint) value . The difference between the two values is multiplied by the time during which the difference is active. The resulting value is referred to as the integral. The integral value is automatically established when heat is being produced. The value can be viewed in the sub-menu TEMPERATURE.

Compressor:
The compressor raises temperature and pressure of the the refrigerant (See "Heat Pump principle" on p.4).

Condenser:
In the condenser , the refrigerant releases its heat ener gyto the heating circuit. (See "Heat Pump Principle" on p.4)

CURVE:
The CURVE value will be adjusted on the control panel. The value indicates the temperature of the water distributed to the radiators (supply line temperature) at an outside air temperature of 0°C.

Refrigerant:
Circuit in the heat pump filled with refrigerant that by evaporation, compression, and circuit condensation absorbs heat energy from the air system circuit and releases it to the Heating circuit.

Refrigerant:
Liquid absorbing energy from the brine system circuit and releasing it to the heating circuit. (See "Heat Pump Principle" on p. 4).

Radiator:
Heating element

Control:
The control computer regulates the whole installation. All system settings and computer temperature changes are stored and registered in the computer. Settings are adjusted via the graphic display on the control panel.

Heating circuit :
The heating circuit receives heat energy from the refrigerant circuit and carries it to the water heater or radiator/ floor coil systems. (See further "Heat Pump Principle" on p.4).

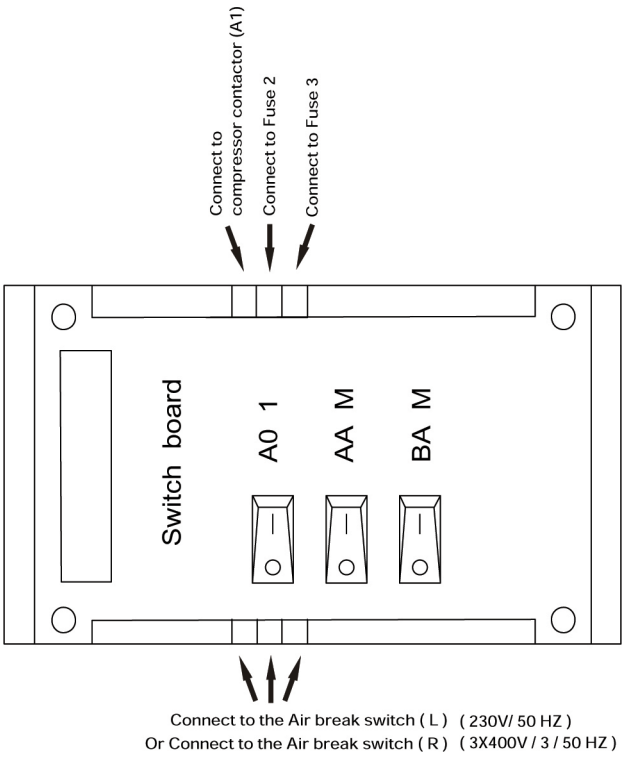
Heat curve:
The heat curve is the control computer's instrument for determining the required supply line temperature of the heating system. Indoor temperature will be adjusted by adjustment of the CURVE value

DESCRIPTION OF THE SWITCH BOARD

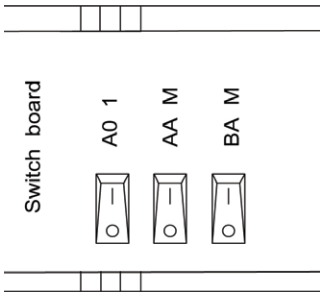
Function

Function of manual switch board:
When test or repair the machine, the compressor, water cycle pump and outdoor fan motor can be force manual startup.

A0 1 : Control the compressor;
AA M : Control the water cycle pump;
BA M : Control the fan motor of outdoor unit.


Connect to compressor contactor (A1)
Connect to Fuse 2
Connect to Fuse 3
Switch board
A0 1
AA M
BA M
Connect to the Air break switch (L) (230V/ 50 HZ)
Or Connect to the Air break switch (R) (3X400V / 3 / 50 HZ)

Initial state
The initial state of the manual switch board are such buttons (A0 , AA , BA),all of them are off.(see the picture). When the machine is running normally, the switch board must be in initial state.

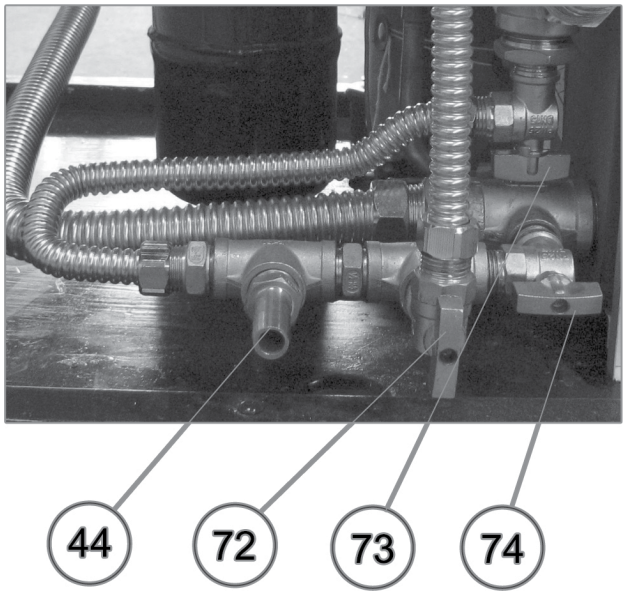


NOTE! The manual switch board is use only if the necessary for test or repair. When the machine is running normally, the switch board must be in initial state. **All switches turned 0 !**

DEALING WITH MALFUNCTIONS

Draining, heat medium side

Close the shut-off valves in heating medium system. And then close the water tank drain valve (72) . and open the drain valve (73 , 74). A small amount of water runs out, however, to fully empty the heating medium side requires the connector that joins the heating medium side and the connection on the heat pump VB-flow to be loosened a little to allow air to enter so the remaining water can run out. When the heating medium is empty the requisite service can be carried out.

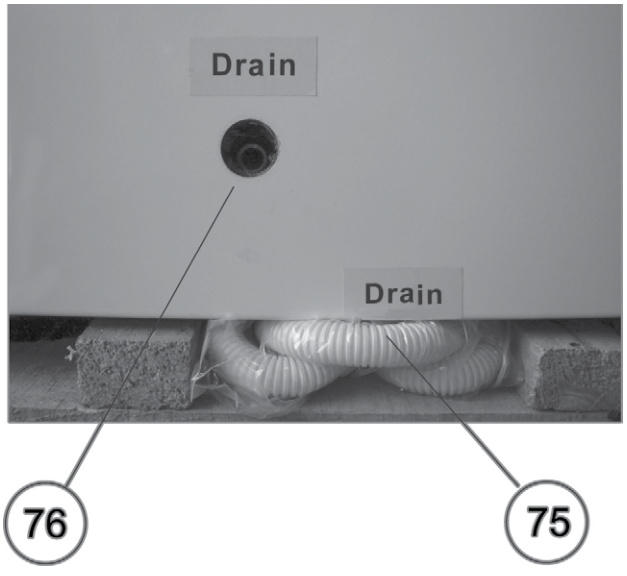


Draining, water tank

First, close the drain valve (73,74). And then open the drain valve (72). When the water tank is empty the requisite service can be carried out.

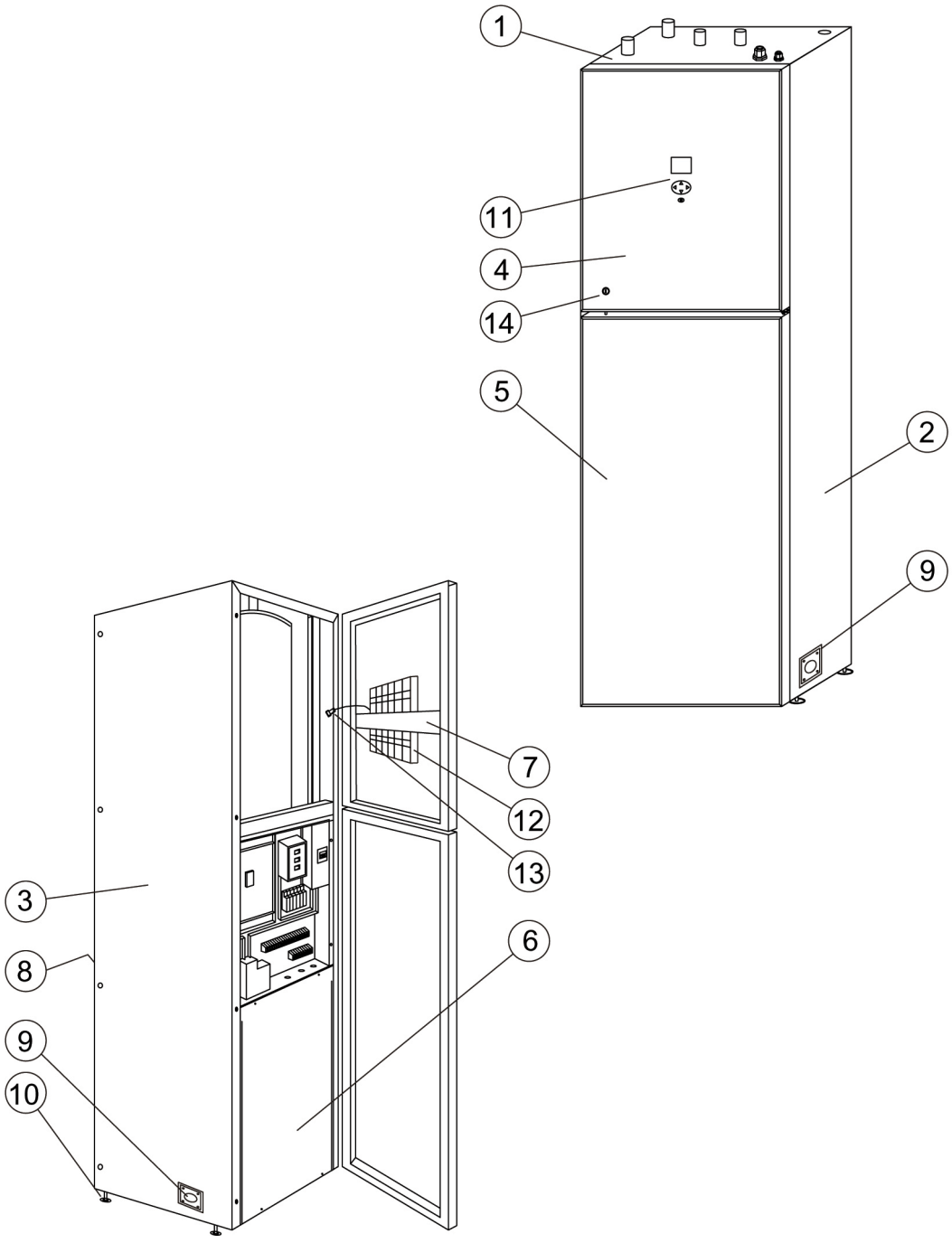
Draining, the chassis

The drain-pipe for the chassis is already assembled in advance before leaving the factory. The consumer is required to place the hose at appropriate location.

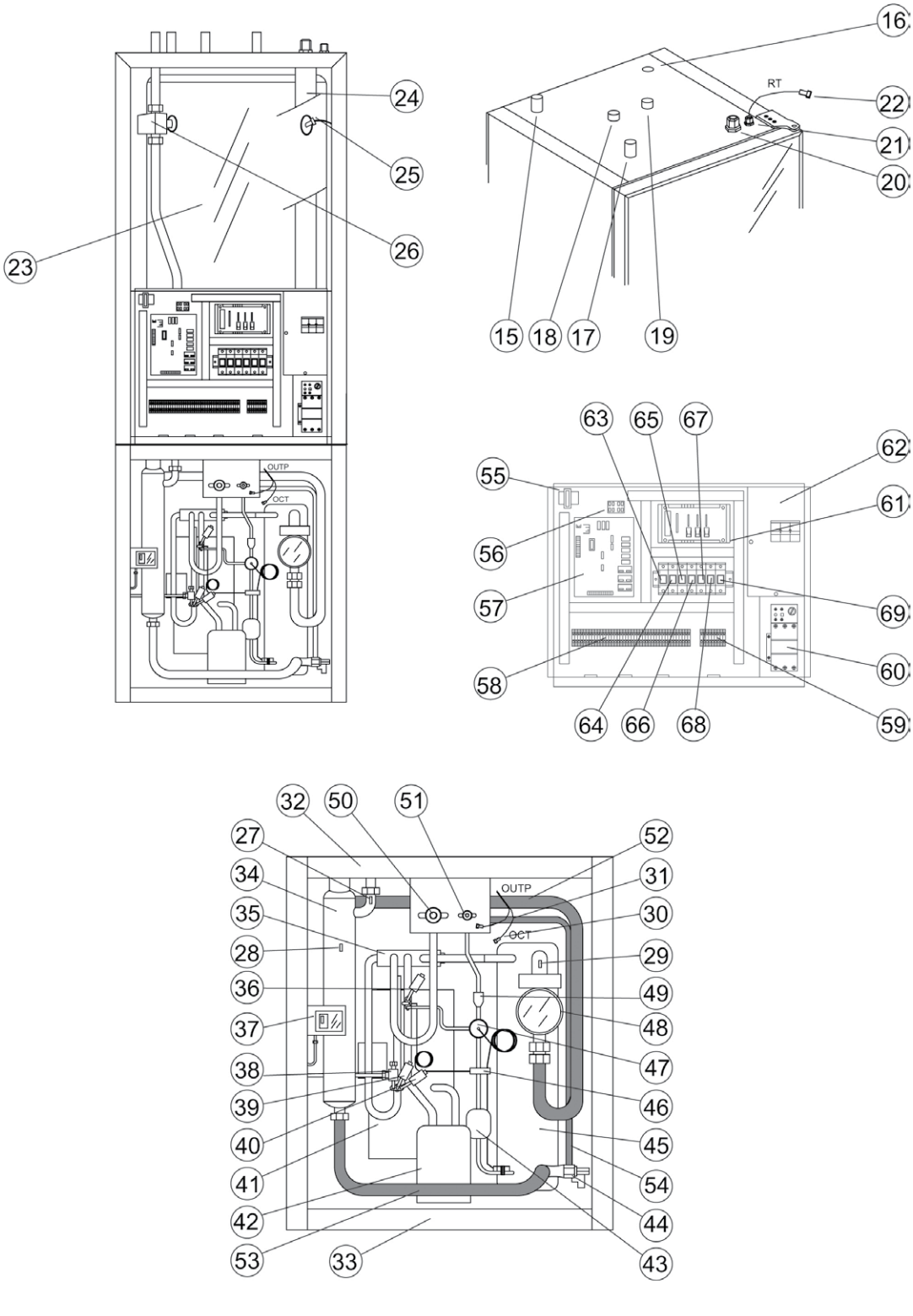


If the operating disturbance cannot be rectified by means of the above, an installation engineer should be called.

COMPONENT PLACEMENT

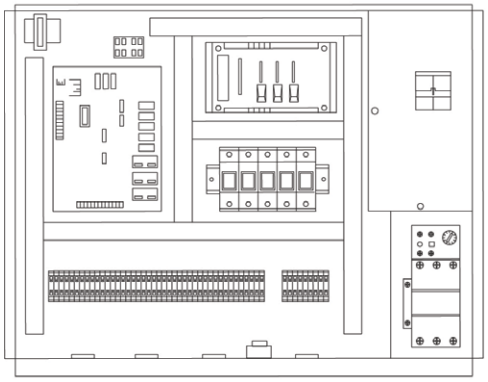


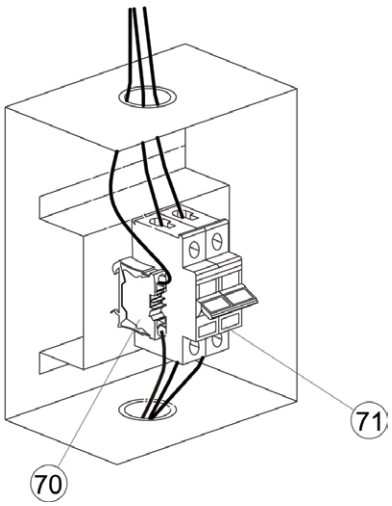
COMPONENT PLACEMENT



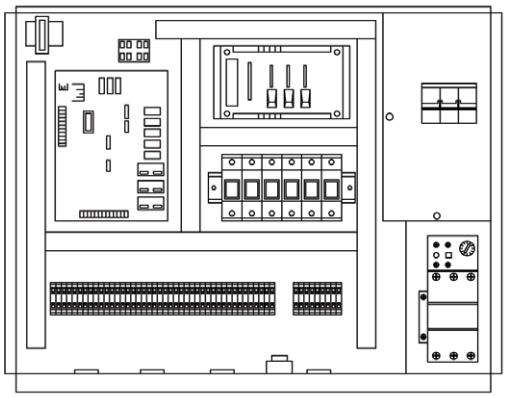
COMPONENT PLACEMENT

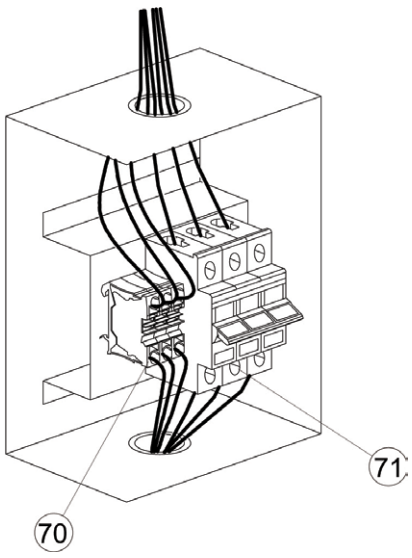
230 V / 50 Hz





400 V / 3 / 50 Hz





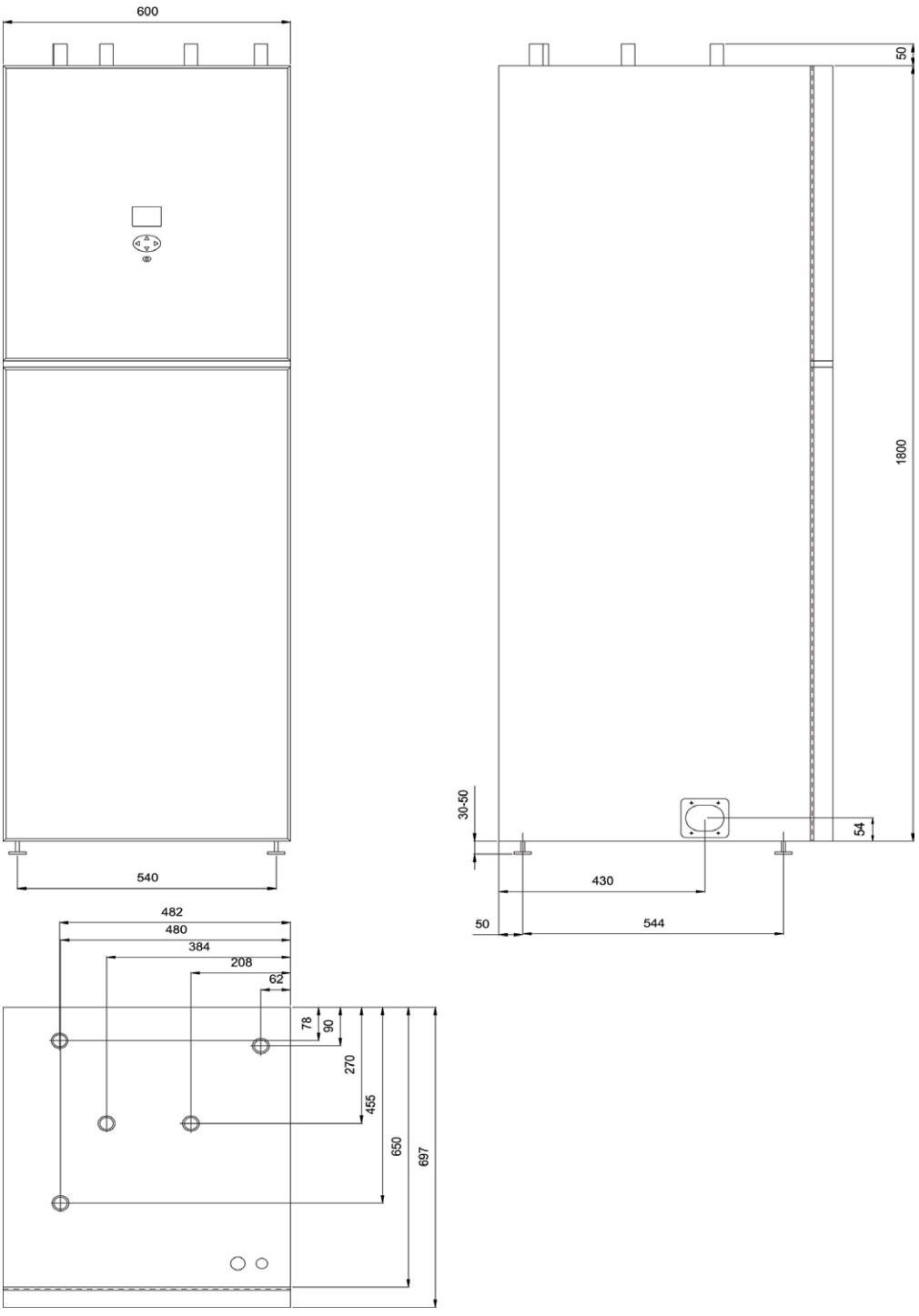
LIST OF COMPONENTS

1 Top board
2 Right side board
3 Left side board
4 Glass upper door
5 Glass lower door
6 Front board
7 Board for fixing control panel
8 The back board
9 Hole for copper pipe connection
10 Stainless steel adjustable feet
11 Control panel
12 Control panel Box
13 Connecting wire of control panel
14 Door lock
15 Connection,heating return Ø 28.58 mm
16 Expansion vessel,connection /1 inch
17 Connection,heating flow Ø 28.58 mm
18 Cold water inlet
19 Hot water outlet
20 Power cord connection hole
21 Temperature sensor connection hole
22 Room temperature Sensor connection
23 Water tank
24 Wire groove
25 Temperature sensor (Water Tank)
26 Three-way valve for waterflow
27 Temperature sensor (heating flow)
28 Temperature sensor (Electrical auxiliary heater)
29 Temperature sensor (Heating return)
30 Outside air temperature sensor connection
31 Defrost temperature sensor connection
32 Sound insulation board 33 Chassis
34 Electrical Auxiliary heater
35 Four-way valve
36 Low pressure pressostat (OFF 0.05MPa/ON 0.15MPa)
37 Adjustable pressure switch
38 Valve for adjustable pressure switch (OFF 3.3MPa/ ON 2.4MPa)
39 High pressure pressostat
40 High pressure pressostat(OFF 2.9MPa/ON 2.4MPa)
41 Compressor
42 Oil tank
43 Drying filter
44 Waterspout
45 Condenser
46 Pressure releasing valve
47 Expansion valve
48 Heating medium pump
49 Connecting pipe with variable diameter
50 Valve 1
51 Valve 2
52 Heating return pipe
53 Heating flow pipe
54 Drainpipe for Water tank
55 Transformer
56 Neutral line common terminal
57 Circuit board
58 1.5mm2 terminal
59 2.5mm2 terminal
60 AC contactor
61 Switch board
62 Air break switch cover
63 Fuse 1 for 3 way valve
64 Fuse 2 for Water cycle pump
65 Fuse 3 for Outdoor Fan
66 Fuse 4 for Electrical heater 3
67 Fuse 5 for Electrical heater 2
68 Fuse 6 for Electrical heater 1
69 Fuse 7 for Electrical heater 4
70 6mm² terminal
71 Air break switch
72 Draining valve for water tank
73 Draining valve for heating medium pump
74 Draining valve for heating medium system
75 Draining pipe for the chassis
76 Draining hole
77 Room temperature sensor
78 Ourside air temperature sensor
79 Draining connector
80 Conex connectors
81 Particle filters
82 Drainpipe
83 Adjustable Three-way valve for water flow

The component list refers to all types of the heat pump, see respective component placement pictures for information.

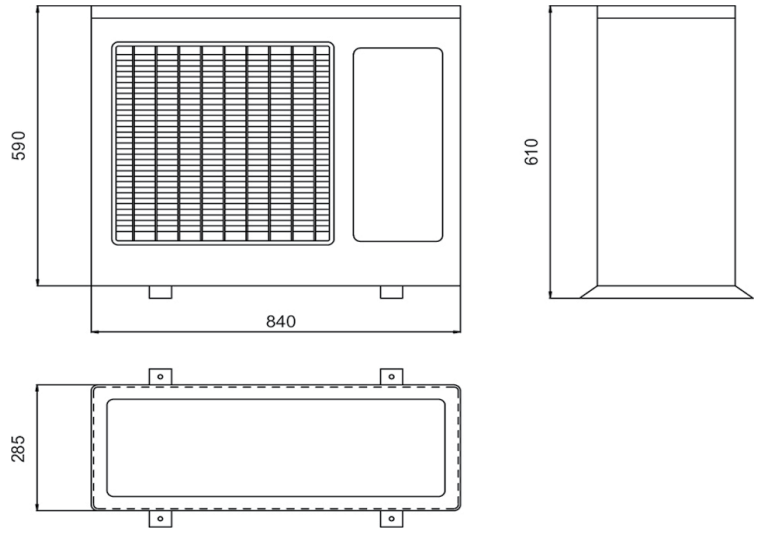
DIMENSION

Dimension and setting-out coordinates

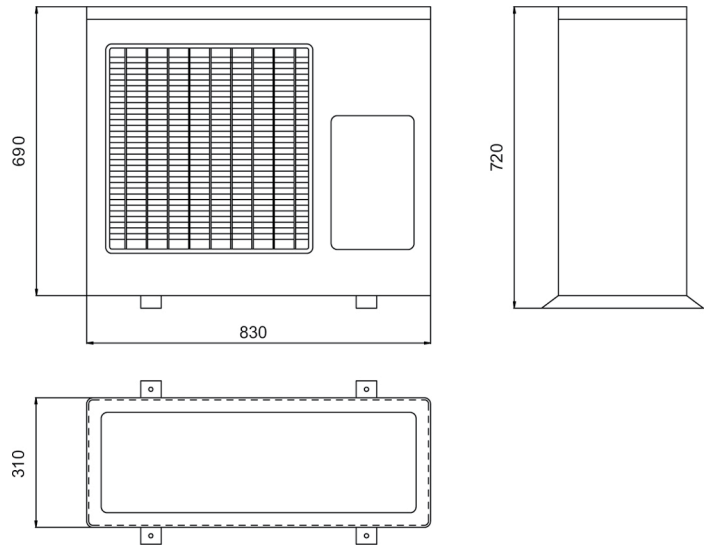


DIMENSION

Dimensions of the AIR MAGNA 150-6 outdoor unit

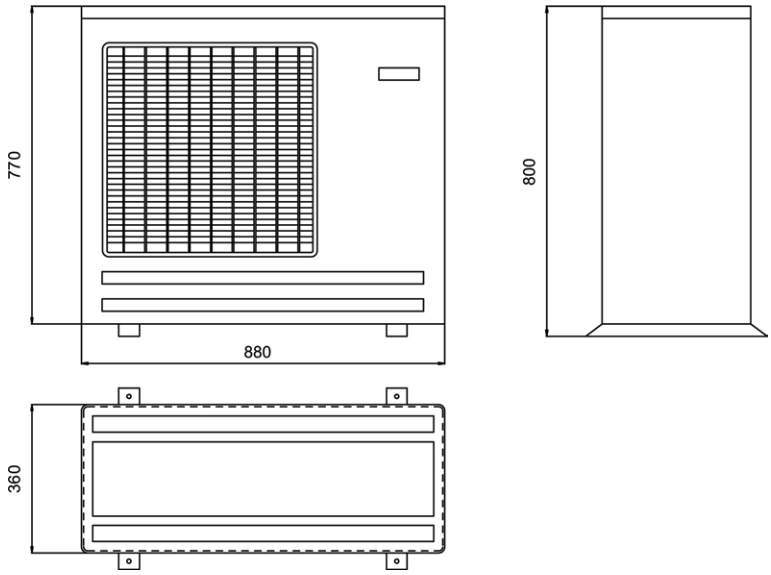


Dimensions of the AIR MAGNA 150-8 outdoor unit

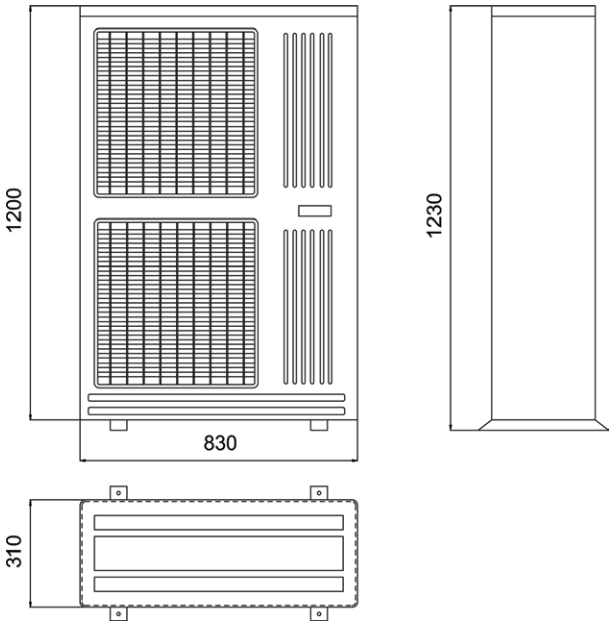


DIMENSION

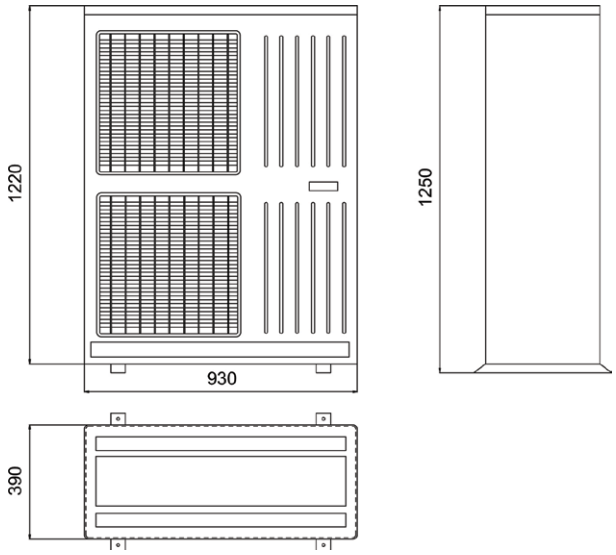
Dimensions of the AIR MAGNA 150-10 outdoor unit



Dimensions of the AIR MAGNA 150-12 outdoor unit



Dimensions of the AIR MAGNA 150-16 outdoor unit



ACCESSORIES

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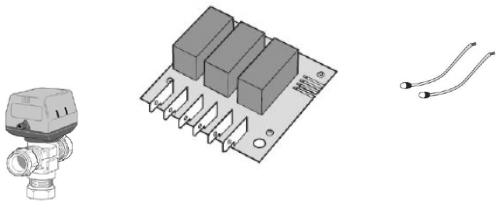
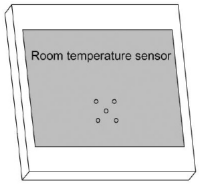


Enclosed kit



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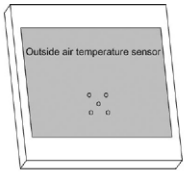

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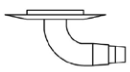

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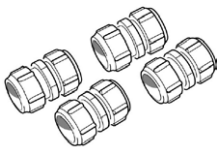

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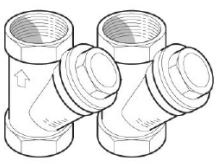

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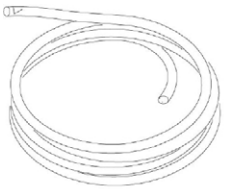

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TECHNICAL SPECIFICATIONS

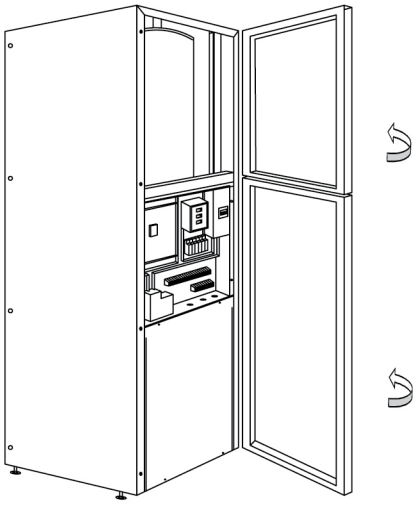
Technical specifications 230V/ and 3x400V

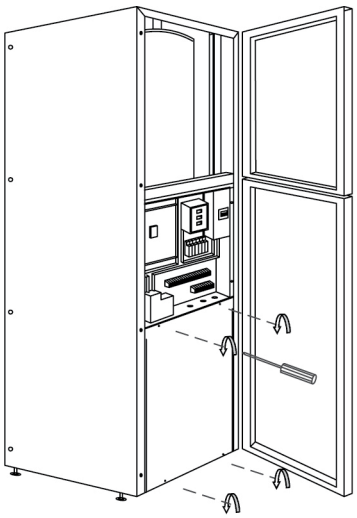
Type		**6**	**8**	**10**	**12**	**16**
Delivered/supplied power* at 7/35 °C **	(kW)	6.6/1.5	8.7/2.0	10.5/2.55	12.9/3.05	16.0/3.7
Delivered/supplied power * at 2/50 °C **	(kW)	4.4/2.0	6.6/2.9	8.4/3.65	10.3/4.2	11.5/4.8
Operational voltage	(V)	230V/50Hz		400V/3/50Hz		
Starting current, compressor	(A)	24	24	30	30	35
Max operating current, compressor	(A)	7.1	9.0	8.9	12.0	12.0
Max operating curr.						
incl. immersion heater 9 kW	(A)	25	25	7.5	8.9	12.0
Output, HC pump	(W)	151	151	151	151	205
Connection heating return o.d. Ø	(mm)			28.58		
Connection heating flow, o.d. Ø	(mm)			28.58		
Water tank inlet/outlet, o.d. Ø	(inch)			3/4"		
Required ceiling height	(mm)			1980		
Volume, water heater	(liters)	150	150	150	200	200
Volume, spiral copper pipe						
Max pressure in storage heater	(liters)	9.8	9.8	9.8	9.8	12.20
Max pressure in spiral copper pipe						
volume	(MPa)			0.9 (9 bar)		
Refrigerant quantity (R407C)	(MPa)			0.25 (2.5 bar)		
Heating medium flow	(kg)	1.15	1.08	1.50	1.85	1.95
Max temp. (flow/return circuit)	(l/s)	0.41	0.41	0.41	0.41	0.41
Cut-out value pressostat HP	(°C)			68/55		
Difference pressostat HP	(bar)			-7		
Cut-out value pressostat LP	(bar)			0.5		
Difference pressostat LP	(bar)			+1,5		
Enclosure class				IP 21		
Noise of indoor unit	dB(A)	48	48	46	48	48
Noise of outdoor unit	dB(A)	45	45	48	50	52
Net/Gross weight of indoor unit	(kg)	203/223	203/223	212/240	228/256	235/263
Net/Gross weight of outdoor unit	(kg)	22/27	27/31	38/42	46/54	62/74

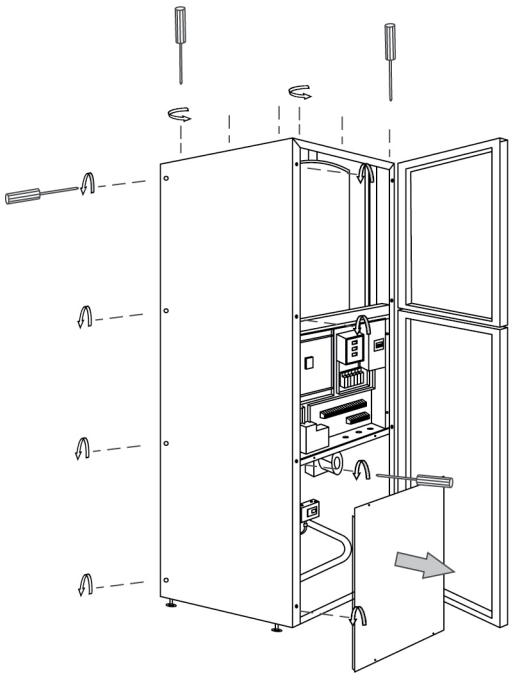
* Compressor output only.

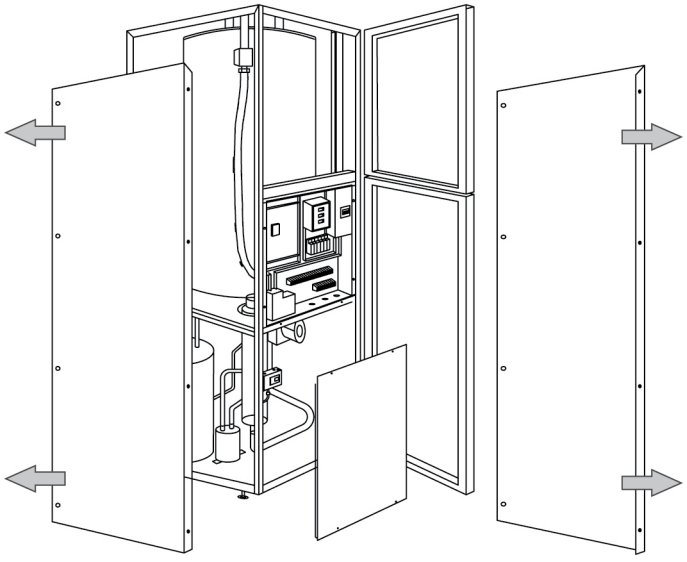
** Refers to the brine flow temperature/heat medium flow temperature in accordance with EN 255.

*** With feet and connections dismantled the height is 1900 mm.









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